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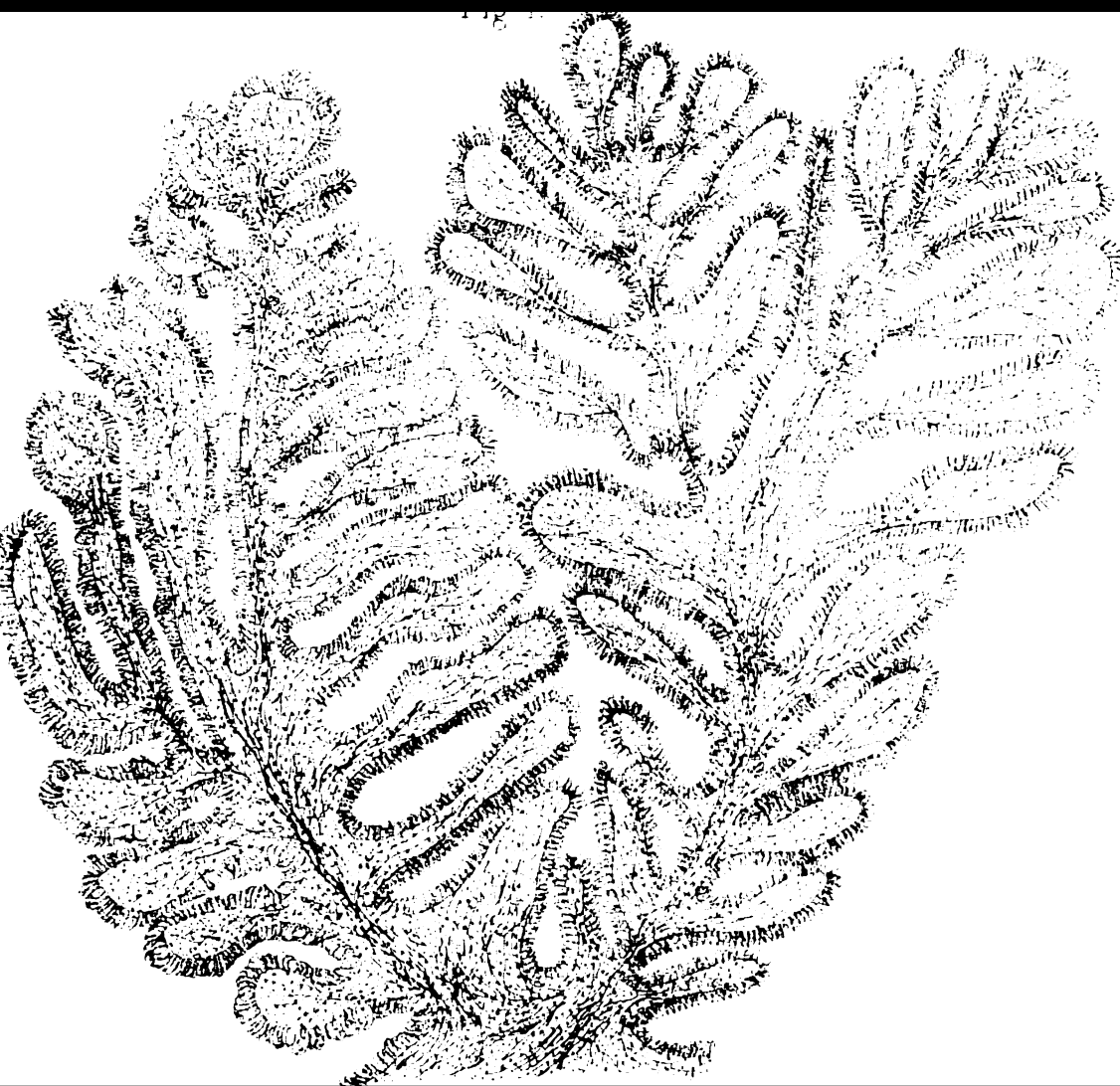
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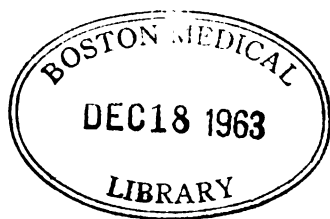
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# *Cancer of the rectum*

William Harrison Cripps



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L. G. Paul

321 Beacon St  
Boston

May 13, 1910.





# **CANCER OF THE RECTUM**



# CANCER OF THE RECTUM

## ITS SURGICAL TREATMENT

*WITH AN APPENDIX OF 380 CASES*

JACKSONIAN PRIZE ESSAY

FIFTH EDITION

BY

*e*  
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LONDON

J. & A. CHURCHILL

7 GREAT MARLBOROUGH STREET

1907



## PREFACE TO FIFTH EDITION

THIS edition has been largely rewritten, and I have added a table of 380 consecutive cases occurring in my private practice, with an analysis of the results obtained both by excision and colotomy.

HARRISON CRIPPS.

2 STRATFORD PLACE,  
LONDON, W.  
1907.



## PREFACE TO FIRST EDITION

THE Council of the Royal College of Surgeons confined the subject of the Jacksonian Prize Essay in 1876 exclusively to the treatment of rectal cancer. Since writing the Essay, I have devoted much time to the study of the minute anatomy of malignant rectal disease, and have also had frequent opportunities of increasing my knowledge of the diagnosis and treatment of the disorder. In this work, therefore, the scope of the original Essay has been enlarged. I take this opportunity of stating how much I am indebted to the kindness of Sir James Paget, Mr. Gay, Mr. Doran, and other friends, for the opportunities they have afforded me of examining various specimens of the disease.

HARRISON CRIPPS.

2 STRATFORD PLACE, W.  
1879.





# CONTENTS

CHAP.	PAGE
<b>I. THE ANATOMY OF THE RECTUM AND THE FUNCTION OF THE MUCOUS MEMBRANE . . . . .</b>	1
Peritoneal relations—Vessels—Levatores ani—Coats of the rectum—Epithelial cells of rectum—Identity of villi with follicles—Formation of leucocytes.	
<b>II. CANCER OF THE RECTUM—ETIOLOGY . . . . .</b>	18
Increase of cancer—Views concerning origin—On transmission by inheritance—On recurrence after removal—Cancer following injury—On local origin of cancer—Auto-inoculation—Methods of extension—Local irritation—Cancer compared with inflammation—Compared with galls—Question of parasitic origin.	
<b>III. RECTAL CANCER—PATHOLOGY . . . . .</b>	43
Classification—Various forms of rectal cancer—Ulceration of tumour—Naked-eye appearances—Commencement of growth—Microscopic anatomy—Relation of epithelium to fibrous stroma—Formation of epithelium—Mode of extension of growth.	
<b>IV. RECTAL CANCER—SYMPTOMS . . . . .</b>	69
Age and sex incidence—Insidious onset—Earliest symptoms—Duration of disease—General symptoms—Illustrative cases—Pain in bleeding discharge—Diarrhoea—Constipation—Digital examination—Symptoms when disease high up—Causing sudden obstruction—Colloid Cancer—Melanotic sarcoma.	
<b>V. RECTAL CANCER—DIFFERENTIAL DIAGNOSIS . . . . .</b>	94
Villous tumour—Disseminated polypi—Growths outside rectum—Acute inflammation—Fibrous stricture—Tuberculous ulceration—Ossifying ovaries—Fibro-muscular tumour—Cyst of Rectum—Submucous fistula—Kidney—Stercolith—Uterus—Prostatic swellings.	
<b>VI. TREATMENT BY EXCISION . . . . .</b>	117
Historical—Selection of cases suitable—Risk to life—Amount of benefit expected—After condition—Relief of pain—Probability of incontinence—Of stricture—Methods of operating—From perinæum—Method of dressing wound—High trans-sacral operation—After treatment—Removal of abdominal section.	

CHAP.	PAGE
VII. TREATMENT BY COLOTOMY . . . . .	145
Historical—Advantages of colotomy—Risk to life—After con- dition—Time for operating—Complications during operation— Complications after operation.	
VIII. PALLIATIVE TREATMENT—GENERAL—LOCAL . . . . .	170
IX. SELECTED ILLUSTRATIVE CASES . . . . .	175
Table A. Explanation . . . . .	185
Table A. Of 380 cases . . . . .	186-247
Table B. Showing number of cures at each period of life . . . . .	248
Table C. Showing sex . . . . .	248
Table D. Showing methods of treatment . . . . .	248
Table E. Mortality from excision, and subsequent history of those who survived . . . . .	249
Table F. Length of time after excision at which patients were alive after recurrence . . . . .	249
Table G. Date of recurrence . . . . .	250
Table H. Length of life when no operation done . . . . .	250
Table I. Duration of life after colotomy . . . . .	250
Table J. Colotomy before and after complete obstruction . . . . .	251
Table K. Duration of total obstruction before colotomy . . . . .	251
INDEX . . . . .	253



## DESCRIPTION OF PLATE I.

FIG. 1.—A vertical section of the rectal wall of a rabbit.

FIG. 2.—A section of a healthy human rectal wall.

FIG. 3.—Adenoid growth (*b*) extending between the muscular (*c*) and mucous coats (*a*).

FIG. 4.—A vertical section of the muscular coat of the rectum. The morbid adenoid growth (*bb*) is seen taking the place of the muscular fibres (*a, a*), while the inter-muscular fibrous bands are greatly thickened.

DRAWN BY HARRISON CRIPPS.

# PLATE I.

Fig. 1.

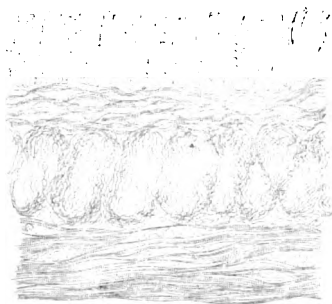


Fig. 2.

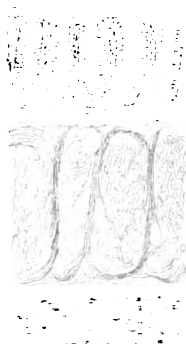


Fig. 3.

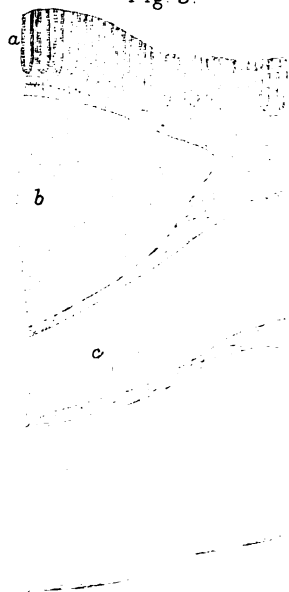
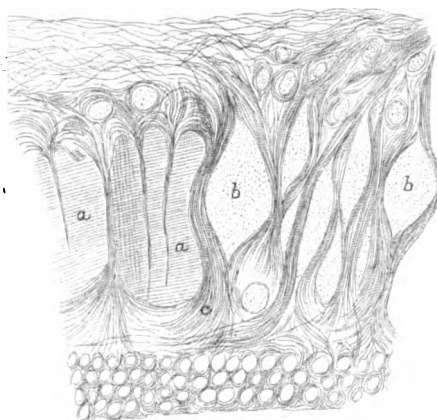


Fig. 4.









## DESCRIPTION OF PLATE II.

**FIGS. 1 to 8 represent cells from the surface of adenoid tumours.**

**FIGS. 9 to 19 represent cells from the deeper portions of the growth.**

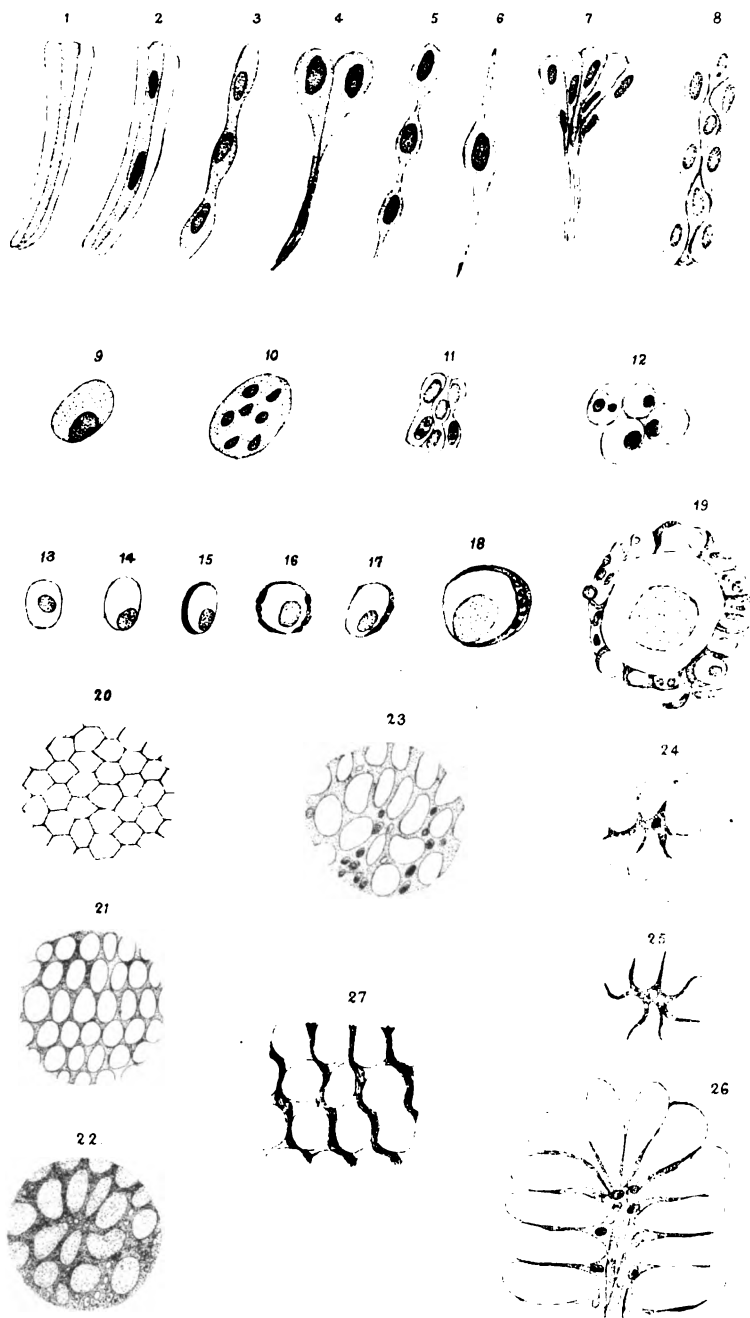
**FIGS. 20 to 22 represent horizontal sections of epithelial cells.**

**FIGS. 24 and 25 illustrate the delusive appearance of so-called stellate cells.**

**FIGS. 26 and 27 illustrate the formation of fibrous tissue from cell walls.**

**DRAWN BY HARRISON CRIPPS.**

# PLATE II.







### DESCRIPTION OF PLATE III.

**FIG. 1** represents retiform tissue converging into fibrous band.

**FIG. 2** is a similar section, the cellular contents having been washed out.

**FIG. 3** represents a section of cells in their long diameter, showing their connection with the intercellular tissue.

**FIG. 4**, a similar specimen, the fluid contents having fallen out.

**DRAWN BY HARRISON CRIPPS.**

PLATE III.

Fig. 1.

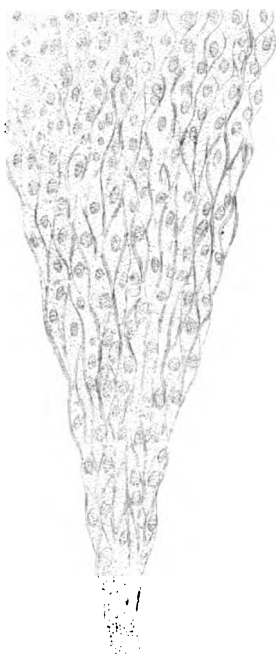


Fig 2.

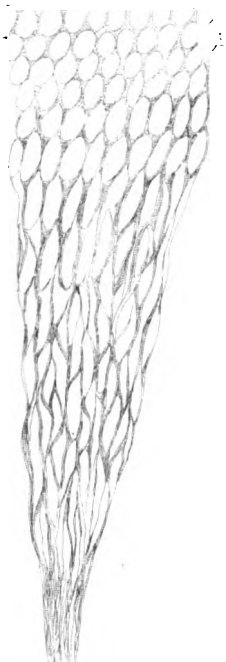
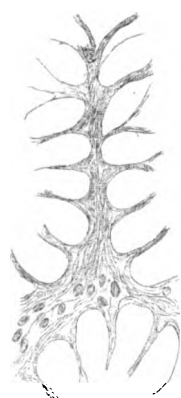


Fig. 3.



Fig. 4.









## DESCRIPTION OF PLATE IV.

Section of adenoid growth, extending along the submucous tissue, between the mucous membrane and the muscular coat. The section is cut at right angles to the surface of the bowel.

- a.* Gelatinous material of doubtful nature (mucus ?) covering the free surface of the bowel.
- b.* Greatly hypertrophied Liberkühn's follicles.
- c.* Upper part of submucous coat, crowded with leucocytes.
- d.* New growth of morbid adenoid tissue. (Hartnack, obj. 4.)

DRAWN BY B. HARRISON CRIPPS.

PLATE IV.











## DESCRIPTION OF PLATE V.

**FIG. 1.**—Section from surface of innocent adenoid growth (polypus).

**FIG. 2.**—Section from surface of a growth in a case of multiple polypi.

In these sections a single layer of columnar epithelium forms the free surface. The fibrous tissue forms a central stalk from which fibres radiate, and expanding into a delicate retiform tissue form the framework for supporting the epithelium.

**DRAWN BY B. HARRISON CRIPPS.**

PLATE V.

Fig 1.

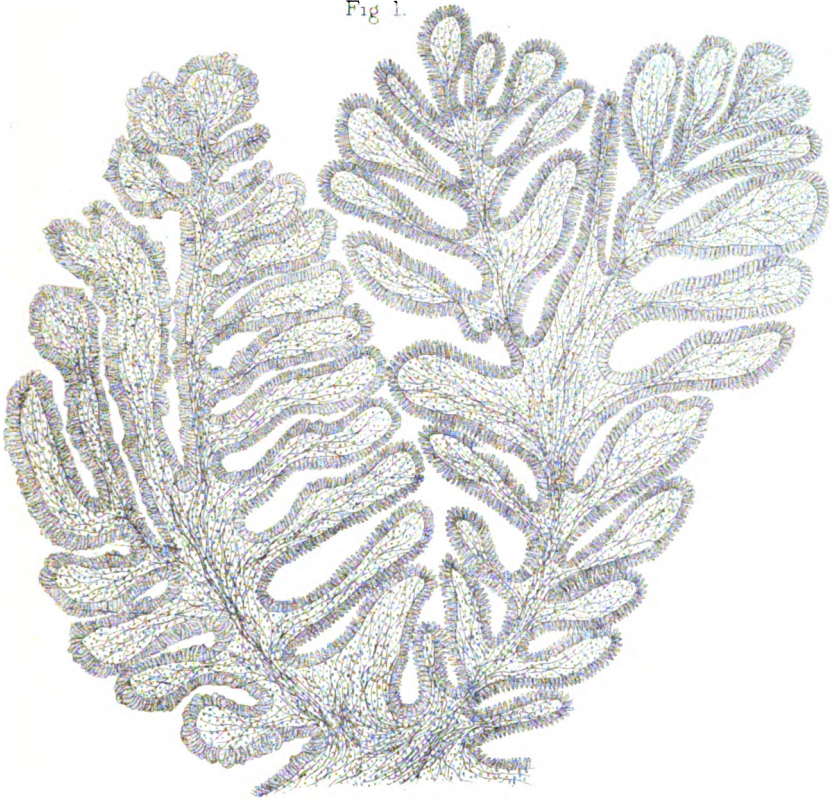


Fig 2.









## DESCRIPTION OF PLATE VI.

**FIG. 1** represents a section of adenoid growth cut at right angles to the surface, and shows how the epithelium lining the cavities in the deeper part of the tumour is in reality but an invagination of that from the surface.

**FIG. 2.**—Portion of surface of a malignant adenoid growth.

**DRAWN BY B. HARRISON CRIPPS.**

PLATE V.

Fig 1.

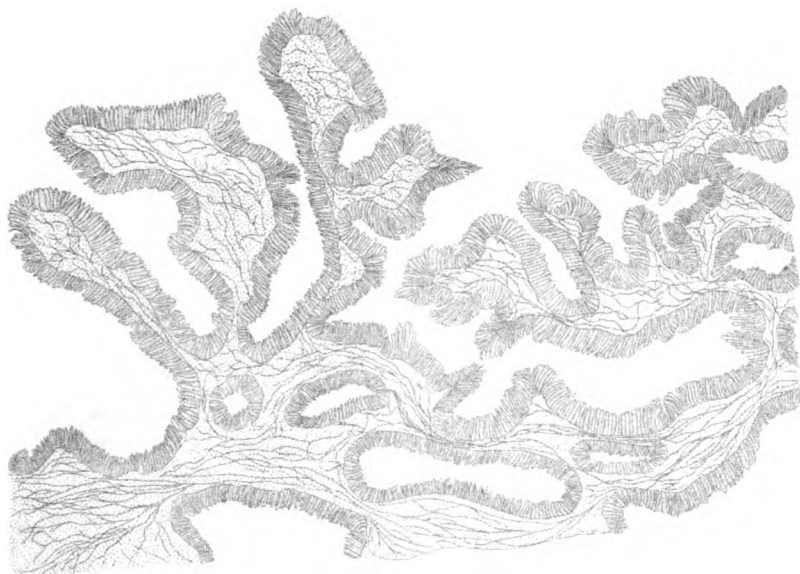


Fig 2







## DESCRIPTION OF PLATE VII.

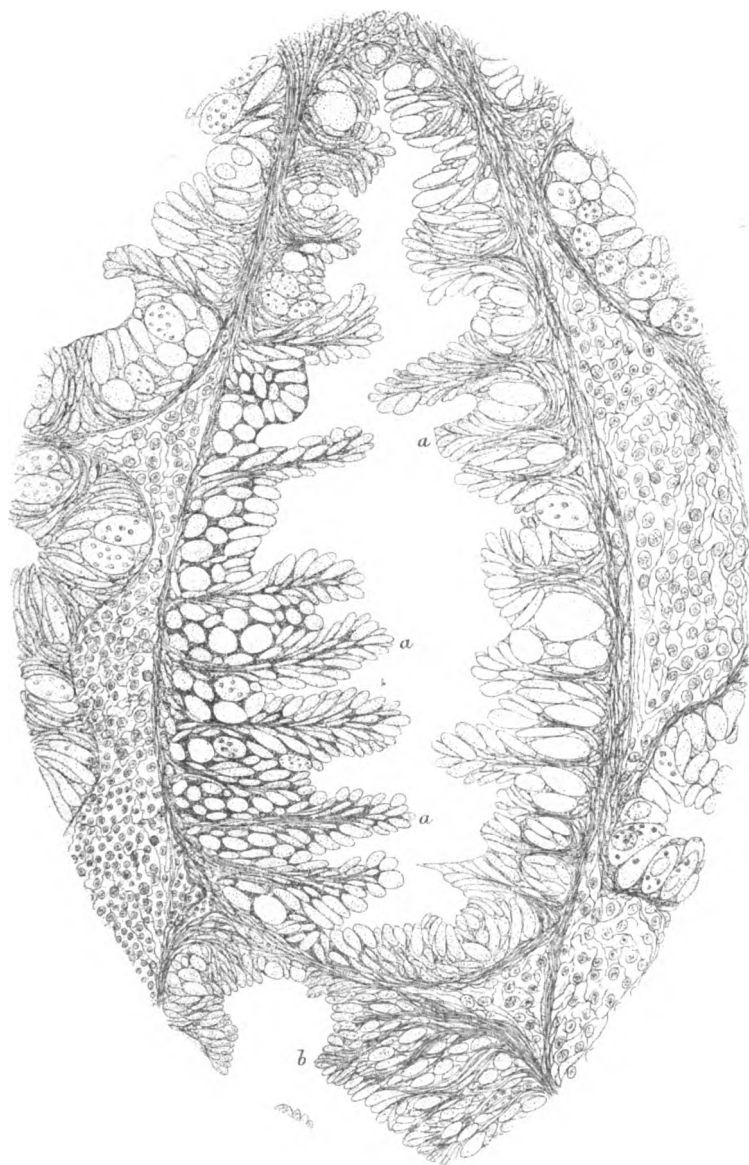
Section of a follicle in an adenoid growth. The cavity is becoming filled by secondary growths (*a, a, a*) from the lining walls.

As the young cells are formed at the summit of a bud, they gradually elongate, and bend over at right angles to its axis.

In the lower portion of the section at *b* the formation of fibrous tissue from the epithelial cells can be traced. (Hartnack, obj. 7.)

DRAWN BY B. HARRISON CRIPPS

PLATE VII









### DESCRIPTION OF PLATE VIII.

**FIG. 1.**—Section of slow-growing adenoid rectal tumour (malignant) extending into the muscular coat.

**FIG. 2.**—From a very slow-growing adenoid tumour (innocent). The epithelial cells are very regular, and the intervening retiform tissue clearly marked. (Hartnack, obj. 4.)

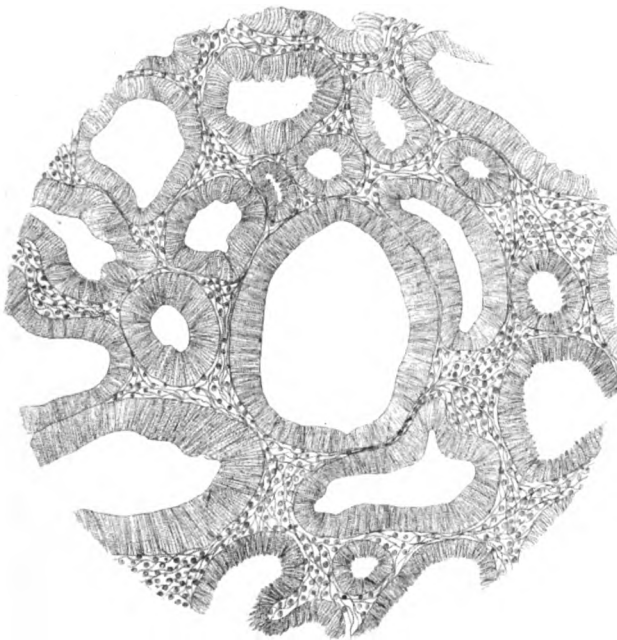
**DRAWN BY B. HARRISON CRIPPS.**

PLATE VIII.

Fig 1.



Fig 2.







## DESCRIPTION OF PLATE IX.

**FIG. 1.**—From rapidly growing recurrent fungous mass forming a large tumour in a few weeks. It is clearly seen to be of an adenoid nature, and is formed on the same plan as the growth in Plate VIII. The cavities, however, are very irregular. The epithelial lining and the intervening retiform tissue are embryonic and ill-defined. (Hartnack, obj. 4.)

**FIG. 2.**—Portion of the same under a higher power. The epithelial lining is scarcely recognisable as consisting of individual cells, for it rather resembles a mass of nuclei with their long axes pointing towards the cavities. The intervening retiform structure is so ill-developed as to represent little more than a spindle-celled tissue.

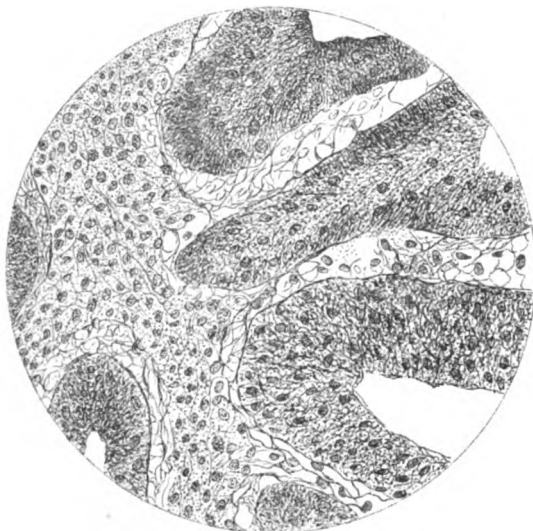
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PLATE IX.

Fig 1.



Fig. 2.









## DESCRIPTION OF PLATE X.

**FIG. 1.**—Section near margin of growth, showing the supposed identity of the nuclei of the epithelium with the leucocytes of the retiform tissue.

Both the nuclei and leucocytes are darkly stained.

**FIG. 2.**—A section of the epithelial margin of a growing tumour showing the absence of basement membrane, and the intimate connection between the growing epithelial cells and the supporting retiform tissue. (Hartnack, obj. 7.)

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PLATE X.

Fig 1

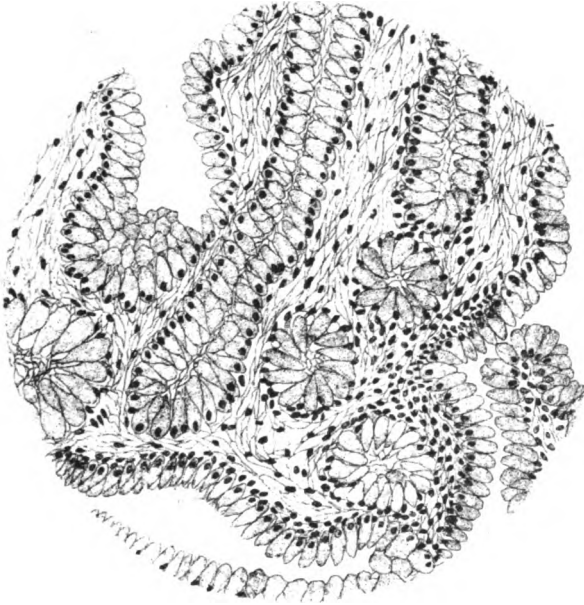
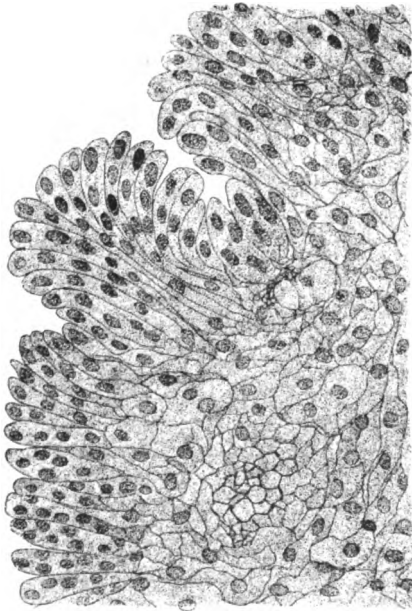


Fig 2.







## DESCRIPTION OF PLATE XI.

**FIG. 1.**—Section through fat, showing the infiltration of the growth between the fat-cells.

**FIG. 2.**—Surface of an adenoid tumour seen through a one-inch power with a direct light.

**DRAWN BY B. HARRISON CRIPPS.**

PLATE XL

171

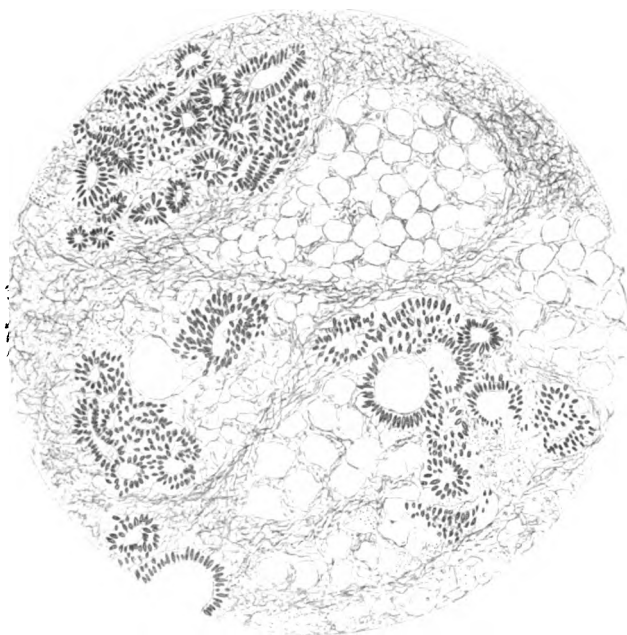


Fig 2.













## DESCRIPTION OF PLATE XII.

**FIG. 1.**—Section of fat-cells near the margin of the tumour. Between the fat-cells can be seen an infiltration of small lymphoid cells.

**FIG. 2.**—A section from the same specimen as Fig. 1, but cut from nearer the morbid growth. The lymphoid cells have acquired a distinctly epithelial character. In places the cavities of the original fat cells remain, in others they have become obliterated. (Hartnack, obj. 9.)

**DRAWN BY B. HARRISON CRIPPS.**

PLATE XII.

Fig 1

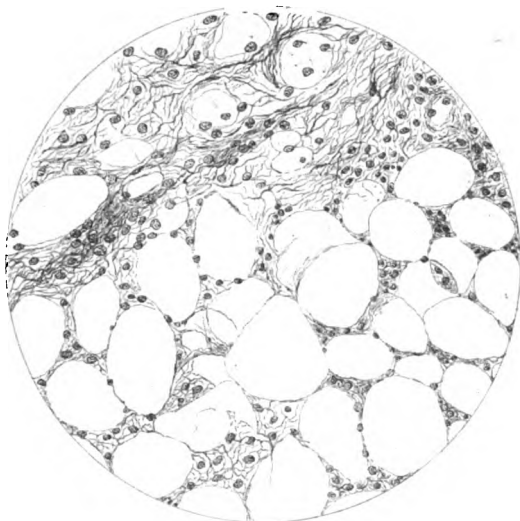
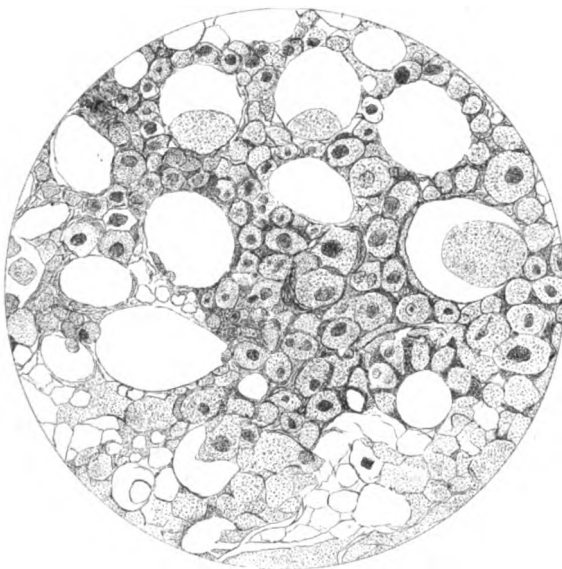


Fig 2









### DESCRIPTION OF PLATE XIII.

**FIG. 1.**—Section of epithelioma. Slight bands of fibrous tissue appear to be forming from the walls of the epithelial cells.

**FIG. 2.**—Border of epithelioma advancing into subcutaneous tissue.

**DRAWN AND LITHOGRAPHED BY B. HARRISON CRIPPS.**

PLATE XIII

Fig. 1

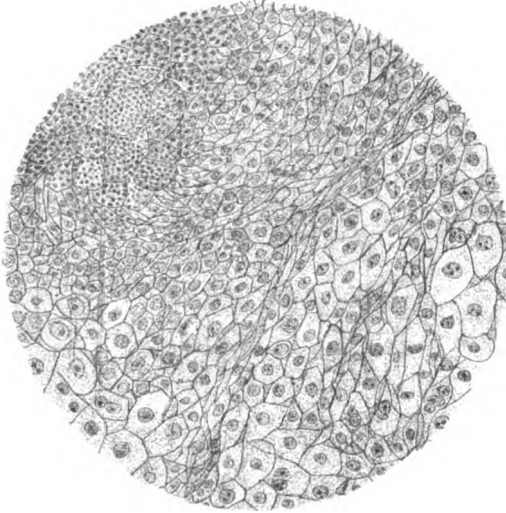
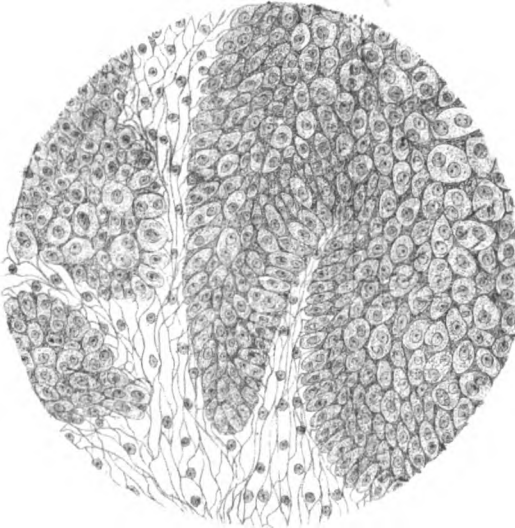


Fig. 2





# CANCER OF THE RECTUM

a)

## CHAPTER I

### THE ANATOMY OF THE RECTUM AND THE FUNCTION OF ITS MUCOUS MEMBRANE

THE rectum varies in length from six to eight inches, the latter measurement being more common in advanced life, for, as age increases, the tortuosity of the bowel is more marked. The rectum extends from the left sacro-iliac symphysis to the anal orifice, the course at first being obliquely downwards for three or four inches slightly to the right of the middle line. It then regains the middle line and follows almost precisely the curve of the sacrum and coccyx as far as the prostate, making another bend slightly backwards to the anal orifice. The rectum is smooth and not sacculated, the separate longitudinal bands found on the rest of the large intestine being absent. Immediately above the anus is a dilatation, often of considerable size.

The rectum may be conveniently divided into two equal portions. Of these portions, the upper will be found in relation behind with the sacrum, separated from it by the pyriformis muscle, by branches of the internal iliac artery, and sacral plexus. In front, it is in contact with the posterior surface of the bladder (in males) when distended, and when the bladder is empty, with the coils of the small intestine. At its commencement the rectum

C. R.

A

is generally surrounded by the peritoneum, which binds it to the sacrum, but lower down the peritoneum covers its front surface only, and is then reflected on to the bladder, forming the recto-vesical pouch. In the female the vagina and uterus are interposed between it and the bladder. A knowledge of the exact distance to which the peritoneal pouch descends is of much importance. Anatomists vary considerably in their estimates of the distance from the anus at which the peritoneum is met with, but the want of uniformity in their results probably depends more on the manner employed in obtaining measurements than in any material deviation in the subjects experimented upon.

Dupuytren \* gives the distance as about seventy millimètres, and further states that, if the bladder and rectum be completely empty, this distance is reduced, the peritoneum falling to the prostate.

Lisfranc † gives the distance as six inches in the female, four in the male, but does not state whether the bladder was distended or empty in his experiments.

Sappey, Velpeau, and Legendre nearly agree in giving the distance as about five and a half centimètres when empty, and eight centimètres when the bladder is distended. The English anatomists, Gray and Quain, make the distance four inches, but do not mention the state of the bladder or make a difference between the male and female. After careful measurement in a large number of bodies, I believe that two and a half inches when the bladder and rectum are both empty, and an additional inch when distended, will be about the average distance; the raising of the pouch by the distended bladder can be shown by injecting water through the ureter when the abdominal cavity is exposed. One of the means I employed in obtaining the measurements was by injecting the peritoneal cavity with plaster of Paris, and then thrust-

\* "La Médecine Opératoire de Lagutiere et Dupuytren," tom. iv. p. 218.

† "Cancer du Rectum," Vidal, 1842.

ing a needle through the skin of the perinæum until its point impinged upon the plaster. My measurements correspond pretty closely with those of J. B. Roberts, who made a very complete and careful set of experiments in determining this question, his results being published in an interesting paper \* read before the Philadelphia Medical Society.

The peritoneal pouch is pretty firmly fixed in its position, and in a healthy body can scarcely, if at all, be dragged down by pulling on the lower part of the rectum. In disease, however, especially if accompanied by a stricture, the constant straining of the patient during many months seems to render both the pelvic fascia and the peritoneal pouch much more mobile, and under such circumstances it is more readily drawn down.

The lower half of the rectum, extending from the third piece of the sacrum to the margin of the anus, is in relation behind with the sacrum, coccyx, and fibres of the levator ani. Anteriorly it is in relation with the vesiculæ seminales, the base of the bladder, and the under surface of the prostate in the male, while in the female it is in connection with the posterior surface of the vagina. At its termination it is surrounded by the sphincter muscles, while it is also partly supported by the levatores ani. In the male the distance from the anterior margin of the anus to the bulb of the urethra is usually a good inch. Dr. Symington, in an able and interesting paper,† calls special attention to the relations of the opposed walls of the empty bowel to each other. By making frozen sections of the parts he demonstrates that in the last inch of the bowel (anus) the mucous membrane is seen thrown into numerous longitudinal folds—the columns of Morgagni—but the canal is essentially a longitudinal slit—with its lateral walls approximated. On the other hand, the rectum immediately above the anal canal presents the form of a

\* "Medical and Surgical Report," Philadelphia, June 9, 1877.

† *Journal of Anatomy and Physiology*, vol. xxiii.

distinct transverse slit, its antero-posterior walls being in contact. Dr. Symington thus agrees with Dr. Hart.\*

The **Arteries** of the rectum are derived from the superior, middle, and inferior hæmorrhoidal, and sometimes a branch or two from the vesical. Of these, the superior hæmorrhoidal is the most important; it is the direct continuation of the inferior mesenteric, and runs down behind the rectum, slightly to the left of the middle line, between it and the sacrum, from about four to four and a half inches from the anus. It then divides into two branches, which almost immediately break up into three or four smaller branches, and run down parallel to one another close to the anal margin. These branches become looped, and anastomose freely with the middle and inferior hæmorrhoidal vessels. The main branches of the superior hæmorrhoidal running parallel with the bowel account for the smallness of the hæmorrhage from incisions made in its long axis and the profuseness of the bleeding from cuts made at right angles to its length. The fact of the lower part of the rectum being chiefly supplied by these branches, which run down in its coats, explains the comparative freedom from bleeding when isolating the lower end of the bowel from its lateral connections.

The **Veins** returning the blood from the anal margin are the middle and inferior hæmorrhoidal, the blood from which eventually finds its way into the internal iliac, but the rectum proper returns its blood by the superior hæmorrhoidal, from whence the blood passes by the inferior mesenteric to join the portal circulation. The superior hæmorrhoidal veins commence close to the anal verge, rather beneath the muco-cutaneous surface than the mucous membrane proper.

Some ten or a dozen minute primitive branches starting from little pouch-like dilatations pass up the bowel for an inch or more, gradually converging into five or six larger

\* "On some points in the Physics of the Bladder and Rectum," *Edin. Med. Journ.*, 1882.

veins, which, uniting, eventually form the inferior mesenteric. For the first three inches the rectal veins run beneath the mucous membrane between it and the muscular coats. They then perforate the muscular coats running the rest of their course external to the bowel. Much attention has been called to the fact that the veins pass through the muscular walls, especially by Verneuil, who believed that the contraction of the muscular fibres of the rectum was one of the active causes of internal hæmorrhoids, by obstructing the flow of blood to the portal circulation, a view which I consider there is little evidence to support. Most standard works on anatomy \* state that the hæmorrhoidal branches of the inferior mesenteric vein inosculate freely with those of the internal iliac, thus establishing a communication between the portal and systemic veins. Such a communication may exist at the anal margin of the rectum, but I believe it is extremely slight, and moreover, if it does exist, the flow of blood can only be in one direction—viz., towards the iliacs.

This I have been able to demonstrate by the following experiments: (1) The hæmorrhoidal plexus cannot be injected through the iliac veins, proving that if a communication exists valves must prevent the blood flowing in this backward direction. (2) The hæmorrhoidal plexus can be at once injected through the inferior mesenteric, but the injection will not pass on into the iliac veins, so that if any communication exists it must be very slight.

The foregoing experiments in great measure corroborate the view so ably maintained by John Gay,† in his well-known work on hæmorrhoidal diseases.

The nerves supplying the highly sensitive surface about the anal margin are derived both from the fourth sacral and the pudic, while the external sphincter and

\* Morris's "Anatomy," 3rd edition, 1902, p. 659; Gray's "Anatomy," 16th edition, p. 748; also Quain's "Anatomy," 10th edition, vol. ii. pt. ii. p. 541.

† "On Hæmorrhoidal Disorders," 1882, by John Gay.



levator ani also obtain muscular filaments from both these sources. The terminal branches of these nerves communicate freely with the sacral plexus and great sciatic. These communications and the common central origin of the nerves in question explain the phenomenon of transferred pain sometimes experienced in rectal disease.\* The rectum receives its nerve-supply from the hypogastric plexus of the sympathetic.

The lymphatics of the anus are generally distinct from those of the rectum, the former running to the inguinal glands, the latter to the sacral and lumbar glands. It is important to remember this, for it will account for the constancy with which the inguinal glands become infiltrated after the anus has for any length of time been cancerous; while cancer of the rectum will often run its course without any symptoms of glandular enlargement.

Yet occasionally, notwithstanding that the cancer is well within the rectum and has not spread to the anus, the inguinal glands become infected, as in two cases mentioned in the chapter on Cancer.

**Levatores Ani.**—I would wish to call special attention to the anatomy of these muscles, as having an important bearing on the mechanism of rectal stricture. With the valuable assistance of my colleague, Mr. Lockwood, I made a careful examination and dissection of these muscles, and found that the origin and insertion of the fibres do not correspond with the descriptions given in the ordinary text-books of anatomy.

Quain, Gray, and Ellis give almost identical descriptions of these muscles, of which the following, from Quain,† is an example :

“The levator ani arises in front from the posterior surface of the pubes, near the symphysis, and midway between its upper and lower borders; behind, from the

\* See case mentioned by Brodie in his Lectures, vol. iii. p. 141. See also Hilton, “Rest and Pain,” Lecture xii. p. 296.

† Quain’s “Anatomy,” 10th edition, vol. ii. pt. ii. p. 551.



FIG. 1.



SIDE VIEW OF THE LEVATOR ANI.

A, anus ; B, bladder ; C, coccyx ; LA, levator ani muscle ; S, pubic bone sawn through external to symphysis. The fibres of the levator ani are seen arising by a tendinous attachment from the pubic bone ; the posterior fibres then cross the rectum at nearly right angles, two inches from the anus, to be inserted into the coccyx.—Drawn from a dissection by William Pearson at the Royal College of Surgeons.

spine of the ischium, and between those points from the pelvic fascia along the line of attachment of the obturator fascia. Some of its fibres are also traceable upwards in the substance of the pelvic fascia above the level of the obturator. From this extensive origin the fibres of the levator proceed downwards and inwards towards the middle line of the floor of the pelvis. Its posterior fasciculi are inserted upon the side of the lower end of the coccyx; the bundles immediately in front of the coccyx unite in a median raphé with those of the opposite side as far forward as the margin of the anus; the middle and larger portion of the muscle is prolonged upon the lower part of the rectum, where it is connected with the fibres of the external sphincter, and slightly with those of the internal; and, lastly, the anterior muscular bundles pass between the rectum and the genito-urinary passage, and, descending from the side of the prostate unite beneath the neck of the bladder the prostate and the neighbouring part of the urethra, with corresponding fibres from the muscle of the opposite side, and blend also with those of the external sphincter, and deep transverse perineal muscles."

With the greatest respect to the authorities quoted, I venture to assert that the description is inaccurate, and the following account I believe will be found to correspond to what may be seen in the dissected body.

In proof of the accuracy of my observations, I would refer my readers to two of Mr. Pearson's beautiful specimens at the College of Surgeons. One of these is a side view of the parts, and is used as one of the dissections at the primary anatomical examinations. The other is in the museum, and shows both the levatores ani in position as dissected from behind.

If a side view of the pelvis be made, and the part dissected in such a way as to expose the whole of the outer surface of the levator ani, it will be seen that a large portion of the fibres arising from the inner surface of the

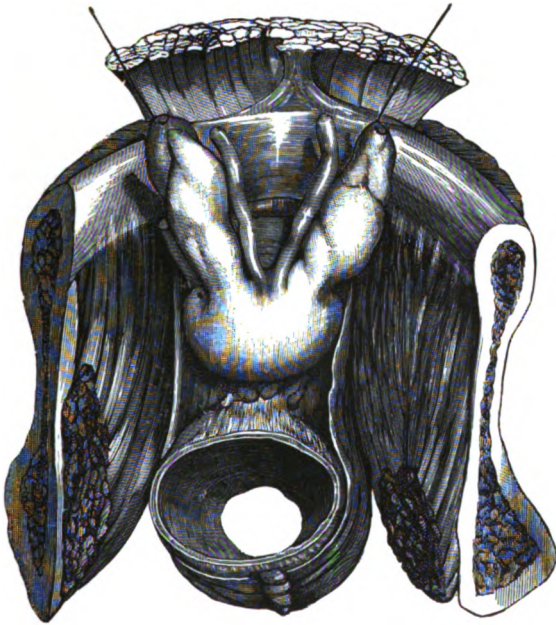
symphysis and from half an inch of the anterior portion of the white line pass obliquely downwards and backwards, to be inserted on the sides of the coccyx. The upper half of the muscle is tendinous, while the lower half, or that attached to the coccyx, is muscular. The posterior edge of the muscle is somewhat thicker, and forms a distinct and free border, which crosses the rectum at very nearly right angles: the point of bisection being an inch and a half to two inches from the anus. In the specimen referred to in the College of Surgeons there is a particularly thick band of fibres thus passing from the inner surface of the symphysis to the sides of the coccyx (*see* Fig. 1).

Again, by referring to the drawing (Fig. 2), in which both muscles are seen *in situ* from behind, it will become obvious what must be the action of the levatores ani when they both contract simultaneously. So far as the coccyx is movable, they will tend to draw that bone upwards towards the symphysis, but, since in most bodies the coccyx scarcely moves, they will act powerfully as compressors of the rectum, squeezing the sides of the canal together as it passes between their two inner surfaces. In fact, when contracted, owing to their insertion near the middle line, they assume a shape like the letter V, the arms of which only diverge about an inch from each other at their attachment to the symphysis.

On passing the finger into the bowel of a dissected specimen, and then drawing on the origin of the muscles, the sensation is communicated to the finger as if a cord or narrow piece of tape were encircling the bowel on its outer surface.

Now, if the finger be passed into a healthy bowel, a momentary grip will be felt as it passes through the lower portion. This, no doubt, is due to the reflex contraction of the internal sphincter muscle. The contracting portion of the bowel is generally the last inch, but sometimes, however, the contraction extends further up, a discrepancy due to the varying width of the internal sphincter fibres.

**FIG. 2.**



**LEVATORES ANI SEEN FROM BEHIND.**

The prostate and vesiculæ seminales have been drawn upwards by hooks. The free posterior borders of the levatores ani are seen passing downwards from near the symphysis to the coccyx, partially encircling the rectum in their course.—From a dissection by William Pearson at the Royal College of Surgeons.

*To face page 8.*



If the patient be now told to draw up the bowel as much as possible by voluntary movement, the finger will be found again to be grasped by the lower portion of the bowel. The amount of bowel thus voluntarily contracted varies greatly in different individuals. In some the contracted portion ends at least an inch and a half from the anus, corresponding to the tip or sides of the coccyx. The upper margin of the contracted portion ends abruptly, and gives a sensation of a broad muscular band round the bowel, not crossing it exactly at right angles to its axis, but set slightly obliquely as if sloping towards the coccyx. Since this contraction is brought about and maintained voluntarily it cannot be due to the internal sphincter, an involuntary muscle, neither is it owing to the external sphincter, which merely surrounds the anal outlet. But by remembering the dissection I have already described of the levator ani, it will at once be seen that these contracting fibres really belong to that muscle, and especially to those fibres which pass from near the symphysis to the sides of the coccyx. In women these fibres are more highly developed than in men, no doubt owing to the muscular floor of the pelvis having to support more important organs than in the male.

It affords me much pleasure to find that Dr. Gant,\* the eminent Professor of Kansas City, U.S., refers to my views of the function of the levatores ani, and by independent dissections confirms them.

Some of the fibres of the levator ani, or, at any rate, some of the fascia to which they are attached, pass over the rectum blending with the fibres of the opposite side, which helps to explain the sphincter-like action that can be exerted by these muscles on contracting, and throws much light, as will be subsequently explained, on the pathology of rectal stricture.

The **Rectal Walls** consist of four coats—mucous, submucous, internal muscular, and external muscular.

\* "Diseases of the Rectum," by P. G. Gant, Kansas, U.S., p. 9.



These coats can be readily separated the one from the other by dissection. From the mucous and submucous tissue many fibrous bands run down perpendicularly between the bundles of muscle, and these fibres becoming slightly thicker form a septum between the muscular bands (Figs. 1 and 2, Plate I.). Upon reaching the plane between the external and internal muscular coats a large number of the fibres assume a horizontal direction, while others pass vertically into the external coat, where they again form the septa between the bundles of muscle. Some fibres pass quite through the external coat and blend with the fibrous stroma of the surrounding fatty tissue. From the perpendicular septa dividing the larger muscular bundles numerous fine processes pass off between the muscular fibres; these again subdividing form the ultimate sheaths of the individual fibres of muscle. It will be thus seen that the connection between the various coats is formed by portions of fibrous tissue being directly continuous from one to the other, and also by the continuity of the blood and lymph-vessels. The total thickness of these coats collectively varies greatly in different subjects. The variation is found chiefly in the muscular coats, the other two coats remaining pretty constantly of the same thickness.

At three to four inches from the anus in a healthy rectum the thickness of the mucous membrane, that is, from base to apex of a follicle, is millimètre 0·4.

**Mucous Membrane.**—This consists of Lieberkühn's follicles and the intervening tissue. The follicles are tubular depressions arranged with great regularity; they are set so close together that the width of the intervening tissue is, on the average, about one-sixth the diameter of the follicle (*see* Fig. 2, Plate I.). The length of the tubes is about four to five times their diameter, the respective measurements being—length, millimètre 0·35; diameter, millimètre 0·08. These tubular depressions are lined with epithelial cells arranged with their long axes at right

angles to the cavity. The apices of these cells look into the cavity of the follicle, while their bases rest upon the adjacent retiform tissue. On cross section it is seen that from fifteen to twenty cells are required to complete the circular lining. While from above downwards their number amounts to forty or fifty. Taking the higher figures in each case,  $20 \times 50 = 1000$  will represent the number of individual cells in each tubular depression. In each square inch of the large intestine there are about 57,000 follicles—the number of cells  $57,000 \times 1000 = 57,000,000$ —in each square inch. These cells are directly continuous with those lining the surface of the mucous membrane, and are, therefore, continuous from one follicle to another.

The length of the individual cells varies greatly, but have an average length of about  $\frac{1}{600}$ th of an inch, with diameter of  $\frac{1}{2000}$ th. The lumen of the follicle occupies one-third of its diameter.

The appearance of the cells is analogous to the bee's honeycomb—that is to say, that the intervening wall is common to two cells, or has become common by fusion with its neighbour. This appearance is seen in Fig. 20, Plate II., the pressure of cells one upon another causing them to take a well-marked hexagonal form. The cell boundary is a structureless material formed by a condensation of the peripheral portion of the cell substance. The interior of the cell contains a semi-transparent material more or less granular. One or more nuclei are contained within the cell, situated nearer the base than the free end.

The intertubular tissue consists of a fine trabecular network, the meshes of which are very long in the vertical direction, looking, as is probably the case, like narrow lymph-paths running in a direction parallel to the follicles. These meshes are filled with small cells (leucocytes). Perhaps, however, it is hardly right in health to describe the interfollicular tissue as a network, since it is often not more than a single channel. Lymphoid tissue also forms

the bed upon which the tubular glands rest. This tissue is well supplied with blood-vessels.

The submucous coat is chiefly composed of a network of retiform tissue, in which blood-vessels ramify freely. The whole of this network of spaces gradually converges towards the thin straight lymph-paths which run horizontally both in the submucous tissue and between the layers of muscular fibre.

Since, however, the whole of my sections showing the commencement of the lymph-spaces have been taken from morbid specimens, a detailed description of these spaces will be found further on.

The principal office of the mucous membrane of the rectum is absorption, although, at the same time, its surface supplies the lubricating mucus for the fæces. Proof of its absorbing function is supplied by positive evidence. A few ounces of beef-tea injected up the rectum rapidly disappear. Narcotics, especially opium and its preparations, are absorbed as quickly by the rectum as by the stomach. Sometimes the absorption by the rectum is more rapid than by the stomach. The injection of strychnia may be taken as an example.

Without such positive proof the identity of structure between the rectum and the small intestines would afford strong presumptive evidence that they had similarity of function. A careful examination proves the analogy between the villi and follicles, for it can be demonstrated that the follicles are nothing more than what may be described as inverted villi. A glance at the drawing (Fig. 2, Plate I.) will show the alternating arrangement of the follicles and villi. It would appear as if every endeavour had been made to make available the largest possible surface upon which to spread out epithelium.

Supposing for a moment that it was possible to stretch and spread out a portion of the intestinal mucous membrane in such a way that both the follicles and villi became flat, that is, on the same level, a surface would be formed

of columnar epithelium resting on a bed of lymphoid tissue, in which lymph-ducts would be ramifying together with the small blood-vessels, and the surface corresponding to the villi or follicles would lie on the same level and be identical in structure. The surface occupied by the spread-out membrane would cover many times the area of the same membrane when corrugated into the projections of villi or the depressions of follicles.

Another proof that the villi are nothing more than the growing up of the interfollicular retiform tissue is to be found in the morbid growth of the rectum, known as villous tumour, in which form of growth it can be clearly seen that the villi are produced in this manner. Again, it would be mechanically impossible to have a villous arrangement of the mucous membrane without corresponding follicular depressions.

Seeing the structure is identical and the position merely altered by necessity, it is difficult to conceive that the two have distinct functions. In the large intestine it is possible that the absence of villi is on account of the increasing firmness of the fæces and the diminution of the amount of digested material requiring absorption, the surface lining the depressions being sufficient for purposes of absorption, without the villous projections, which would be liable to injury from the hardened fæces.\*

The whole surface of mucous membrane being lined by epithelium, it is clear that absorption must take place through the epithelium, or through the substance between the individual cells.

It appears, however, highly probable that this so-called intercellular substance (or spaces) is nothing more than the blended outline of two adjacent cells, on the grounds given on a subsequent page, in which case absorption

\* As an instance of this, a specimen of the College of Surgeons (No. 1, 288), in which colotomy had been performed twenty years before death, may be taken as an example. The whole mucous membrane below the opening in the colon is thickly covered with villi.

would really take place through the epithelial cells themselves.

Possibly the nuclei of the columnar epithelium may be the means of taking nourishment into the body by escaping into the retiform tissue between the glands, and thus becoming lymphoid cells. According to this view, the columnar epithelial cells lining the rectal follicles have a far higher function than that generally assigned to them by physiologists, and, instead of being employed in a simple secretion of mucus, they are in reality the parents of the leucocytes of the body. They might thus be regarded as representing so many points of individual life, absorbing their nourishment from the intestinal contents, and multiplying by the division of their nuclei, which are passed into the subjacent retiform tissue. The network of retiform tissue underlying the epithelium must be regarded as the dilated commencement of the intestinal lymph system, spread out so as to receive the nuclei from the superjacent epithelium, and to convey them along the lymph-channels to the circulation. It is perhaps dangerous to argue from morbid specimens that a similar process takes place in health. Nevertheless, microscopic evidence afforded by some of my specimens is very suggestive of the theory propounded. One of my specimens, shown at the Pathological Society in 1881, presents an appearance so clear and remarkable that it may be well to give the history of the specimen.

Although I have some thousands of sections cut from many different specimens, the specimen exhibited, together with two or three imperfect slices from the same growth, are the only ones in my possession which show, with anything like similar distinctness, the appearances about to be described.

The section in question was taken from a recurrent nodule, or more probably from a portion of growth which had escaped removal at the first operation. A portion of growth, about the size of a small hazel-nut, was, at the

instant of removal, placed in weak chromic acid solution, being subsequently transferred to spirit and dyed with logwood in the usual manner. It would seem, therefore, that the exceptional clearness of the specimen was possibly due to its rapid transfer to the hardening fluid.

In this specimen the nucleus-like bodies towards the base of the cylindrical epithelial cells forming the surface of the hypertrophied mucous membrane are remarkably clearly defined owing to the intensity with which they have taken the staining. In the sub-epithelial retiform tissue a considerable number of lymphoid cells are similarly darkly stained. In form, size, and the extent to which they have taken the dye, there is no perceptible difference between the bodies (nuclei ?) within the epithelial cells and the bodies (leucocytes ?) within the retiform tissue.

It is scarcely possible not to believe but that they are identical the one with the other. The difference of situation alone remains, and even this in portions is no longer noticeable, for here and there the bodies can be seen so close upon the boundary line between the epithelial and the retiform tissue that it would not be possible positively to state whether the body should still be regarded as a nucleus within the epithelium or as a lymphoid cell in the retiform tissue.

In other specimens suggestive appearances may be seen as to the identity of leucocytes and epithelial cells ; if, for instance, the apex of a growing epithelial bud, such as can be seen in Plate VII., be examined, the young cells which first appear have no visible features by which they can be distinguished from the leucocytes or granulating tissue. This gradual conversion of the lymphoid into the epithelial type can also be well studied when these morbid growths are extending into adipose tissue. Plate XI. is a section of some fatty tissue lying external to the rectal wall, into which the new growth is gradually penetrating. In some portions of the specimen the fat cells are normal ; in others they are completely replaced by the growth.

The first appearance of morbid infection consists in the infiltration of a single layer of leucocytes between the walls of the individual fat cells in such a way that they (the fat cells) become completely surrounded by a one-celled layer of leucocytes. It can next be observed that these leucocytes, surrounding themselves with protoplasm, gradually increase in size, and, in so doing, compress the fat cells between whose walls they lie, so that after a time the outline of the original fat cell is represented by a ring of new growth, a small cavity only remaining to mark the spot of its existence. This, too, in its turn, often becomes completely obliterated by its walls being compressed into apposition, so that all that remains of what once was the cavity of a fat cell is a double line of fine fibrous tissue, the compressed walls of the original cell.

In the meanwhile the invading growth, which was primarily represented by a layer of leucocytes, is now represented by epithelial cells into which the leucocytes have changed, arranged in a circular manner (Plate XII.). It is upon this evidence and that of the growing epithelial buds that the possibility of the development of the lymphoid into epithelial cells is based.

If we now refer to the specimen described on p. 15, and figured in Plate X., and consider what evidence can be adduced to establish that the lymphoid bodies are rather travelling from than towards the epithelium, it must be remembered that the argument is that a lymphoid cell can develop into an epithelial cell, and that an epithelial cell can produce a lymphoid cell.

If the bodies were travelling into the epithelium they must be disposed of in one of the following ways:—They must either accumulate within the epithelial cells, or pass out of the free extremity, or be dissolved, and disappear within the original protoplasm of the epithelium; or develop into an epithelial cell, so that they can be no longer separately recognised. That they neither accumulate nor pass out of the free extremities can be proved,

nor does it appear that they are supplying the place of epithelium that has been shed, for the line remains unbroken. It is not, of course, possible to prove that they do not disappear by absorption. On the other hand, there is some strong indirect evidence that these lymphoid bodies have been derived from the epithelium, for it is in their collection immediately beneath the hypertrophied epithelium that the first evidence of the tumour formation is evinced, and, as will be subsequently shown, they invariably form the advance guard of extending adenoid tissue. At first sight it must be admitted that this accumulation of leucocytes on the outskirts of the growing tumour would as easily admit of the interpretation that they had come from distant parts, as that they had been developed from the local cells. Moxon, and other observers of high repute, state that not infrequently they have noticed in nodules in the liver secondary to rectal cancer, not merely columnar epithelial cells, but a structure actually identical with Lieberkühn's follicles. The deduction to be drawn from these secondary deposits is that they grow from cells originally derived from the rectum. Now, it is scarcely possible to conceive that the large columnar-shaped epithelial cell of the rectum can be transmitted, in the bulk of its complete form, through the intricate lymph-paths between the rectum and the liver; but no such mechanical difficulty lies in the path of the smaller lymphoid cell, which, when arrested in the liver, grows to the likeness of its epithelial parent.

I claim on the foregoing evidence that there is some support to the theory I have advanced as to the formation of leucocytes by the epithelium. Although, of course, it falls short of actual demonstration, I believe it to be worthy of some further attention.



## CHAPTER II

### CANCER OF THE RECTUM \*—ETIOLOGY

THERE is no reason for supposing that cancer, when situated in the rectum differs in its nature from the same disease in other parts of the body. It may be well, therefore, to take a brief glance at the general character of the disorder.

So much ambiguity has arisen as to the meaning of the word cancer, that I will define the sense in which the term is used in this chapter. The modern school of pathologists limit the term to express a group of tumours presenting certain definite structures under the microscope. In this group are included scirrhus, medullary, colloid, and epithelial growths, but the various forms of sarcoma are excluded. The older surgeons, on the other hand, consider the expression cancer as synonymous with the term malignant. It therefore included all varieties of growth that have a tendency to recur after removal, to infect neighbouring glands, or to become generally disseminated about the body. When the Council of the College of Surgeons set the subject for the Jacksonian Prize Essay for 1875, on "Cancer of the Rectum considered with regard to the possibility of Cure by Extirpation," it was in the latter sense that the term was used. I shall, therefore, use the word cancer as equivalent to malignant growth.

The death-rate from cancer has shown a pretty steady

\* The Jacksonian Prize Essay, Royal College of Surgeons, England, 1876 ; 4th edition, 1907.

relative increase during the whole period of which we have accurate returns. The following Table, compiled from the Registrar-General's Reports, shows the proportion of deaths from this disease, compared with those from other causes, during each of the forty years from 1865 to 1904 :

TABLE

1865, 1 in 60	..	1879, 1 in 42	..	1892, 1 in 27
1866 „ 59	..	1880 „ 40	..	1893 „ 27
1867 „ 54	..	1881 „ 36	..	1894 „ 23
1868 „ 53	..	1882 „ 37	..	1895 „ 25
1869 „ 52	..	1883 „ 36	..	1896 „ 22
1870 „ 52	..	1884 „ 35	..	1897 „ 22
1871 „ 52	..	1885 „ 34	..	1898 „ 22
1872 „ 48	..	1886 „ 33	..	1899 „ 22
1873 „ 46	..	1887 „ 31	..	1900 „ 22
1874 „ 47	..	1888 „ 29	..	1901 „ 20
1875 „ 47	..	1889 „ 28	..	1902 „ 19
1876 „ 44	..	1890 „ 29	..	1903 „ 18
1877 „ 42	..	1891 „ 29	..	1904 „ 19
1878 „ 43	..			

Or if we compare the death-rate with the number of persons living, it will be found that whereas in the ten years, from 1871 to 1880, it averaged annually one death from cancer in every 2128 persons living, in the next ten years, 1881 to 1890, the proportion had increased to one in 1696, and in the decade 1891 to 1900 the proportion became one in 1323. The mortality from the disease varies widely in the different districts of England. Nor is it only in different parts of the country that this variation is marked, for even in the subdivisions of the metropolitan districts there is a considerable divergence in the rate of cancer mortality. For instance, in Marylebone, St. George's, Hanover Square, and West London, the rate is 80 in 100,000, while it is less than half this in St. Luke's, Bethnal Green, and Rotherhithe. In forming these tables, deaths amongst women have alone been included ; for cancer is not only more than twice as frequent amongst females as it is amongst males, but the occupation of men in the London districts often takes them away from their homes for at least half the twenty-four hours, and

would thus bring them under different influences from those to which they would be subject at home ; while, on the other hand, women generally pass the greater portion of their day in the same locality.

Upon reflection, there are many causes which might invalidate the statistics showing this apparent increase in the cancer mortality, and amongst these, the most important is the progressive improvement in diagnosis, so that many deaths which are now properly assigned to cancer would formerly have come under various symptomatic headings, such as "marasmus," "abdominal obstruction," "gout," &c. For instance, how many cases of cancer of the larynx, ovaries, or rectum were diagnosed forty years ago ? But, notwithstanding the wide margin that must be allowed for these cases, it is more than probable that there is an actual increase in the amount of cancer amongst the population.

Modern surgeons differ materially in their views as to the origin of cancer. The widest divergence in opinion lies between those who consider that the origin of the disease is to be sought in purely local causes, and those who deem that it is rather to be found in some deep-seated condition of the constitution. Those who consider that the constitution is in fault, believe that there is a condition of the body generally, which renders it liable to burst into cancer with some slight accidental irritation, or even without any apparent irritation at all. In fact, they consider that there is a predisposition or liability to the disease, found only in a certain proportion of human beings, and the tumour is looked upon as merely the expression of a previously morbid condition of the body in general, analogous to the sudden outbreak of inflammation in the joint of a gouty person, or the development of bony growths about the joints of a rheumatic sufferer. Dr. Payne\* expresses the meaning of the word "constitutional" as a "lesion or change

\* "Path. Soc. Trans.," vol. xxv. p. 338.

in which the general disposition of the body has a very large share, and the influence of external causes—injury, irritation, and so on, has a comparatively small share.” As opposed to these views, those who think that the disease is purely local in its origin, contend that the tumour is due to some cause acting locally on a particular part, and that this is the starting-point of the cancer, there being no previous disposition of the body to the disease, but that it only becomes secondarily affected from this original centre.

Many facts and arguments have been brought forward to support either view of the origin of the disease. The chief arguments in favour of the constitutional origin are, first, the hereditary nature of cancer; secondly, its very frequent return after removal; thirdly, its production in certain persons as the result of injury.

**The transmission of cancer by inheritance**, or the particular condition of body liable to be attacked by the disease, has been taught from the earliest times, and is, perhaps, the strongest argument in favour of the constitutional view. Indeed, it cannot be regarded as other than certain proof that a tendency at least to the disease has been directly transmitted. Sir James Paget,\* a high authority on the subject, goes so far as to state that “he is disposed to hold that it is not possible to conceive the origin of cancer, or any disease of the kind, except by inheritance.” Instead of elaborating ingenious theories, such as the localists employ to get over the difficulties of inheritance, or the still more complicated excuses which the constitutionalists find for cancer skipping a generation or two, it may be well carefully to weigh the facts upon which the doctrine of inheritance is founded.

I have published elsewhere† a short paper on this subject, from which I give the following extract:

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\* “Path. Soc. Trans.,” vol. xxv. p. 317.

† St. Bart.’s Hosp. Reps., vol. xiv. (1878)

The hereditary nature of cancer is based upon evidence derived from the following sources :

1st. That it is a matter of common notoriety that cancer runs in certain families.

2nd. Evidence founded upon certain statistical facts.

Now, in dealing with the former statement, such evidence is wholly inadmissible from a scientific point of view without the positive facts upon which it is based. General impressions are often the result of hasty generalisation upon imperfect observations.

From time to time isolated instances may occur of an amount of cancer in a particular family in excess of the average to be expected. Such, for instance, as the case narrated by Sir James Paget,\* in which a lady died of cancer, two of her daughters died of cancer, and eight of her grandchildren ; however, the number of her children and grandchildren who did not die of cancer is not mentioned.

The rareness of such an instance is proved by finding that, out of nearly 300 cases of cancer at St. Bartholomew's Hospital, nothing in the least approaching this history is to be found.

The evidence derived from statistics will now be examined.

In an article by Mr. Baker† will be found a table of cases from the practice of Sir James Paget. Mr. Baker makes the statement that 22·4 per cent. of the cancerous patients were aware of one or more relatives with the same disease. He then gives a table of 103 cases in which one or more relatives were affected. These 103 cases representing only 22·4 of the total number of cases examined, the whole number of cases investigated must have been 460. In these 103 cases amongst the relatives are included aunts, uncles, cousins—first, second, and third—great-aunts, and a great-uncle. But since it is

\* "Path. Soc. Trans.," vol. xxv. p. 318.

† St. Bart.'s Hosp. Reps., vol. ii.

impossible to conceive how a man can inherit cancer from his uncles, aunts, or cousins, the necessity for excluding these is obvious. Further than this, the impossibility of knowing the number of these distant relatives, in order to form a table for comparison between a cancerous and a non-cancerous family, renders them useless for our present purpose.

This objection cannot apply to a man's parents or grandparents; two of the former and four of the latter must be the invariable amount. Now, it is not within the range of ordinary observation that an individual, especially of the hospital class, could even with approximate accuracy assign the cause of death in his four grandparents. The cause of death in the parent is, however, commonly known, especially if the deaths were from cancer. On these grounds, therefore, will be considered the relative frequency with which malignant disease is found in the direct offspring of a cancerous or non-cancerous parent.

Referring to the 460 patients mentioned by Mr. Baker, these must have had 920 parents, unless brothers and sisters belonged to the same family. This was so in four instances; the number of parents will thus be reduced to 916. Amongst these 916 parents cancer occurred 30 times in the mother, 7 times in the father, or a total of 37 times.

This gives one death from cancer in every 24·8 among the parents of cancerous patients.

Two objections to these facts might well be raised:

1st. That it is assumed that all the parents of the cancerous patients were dead—but this would not be the case—and that those still living might eventually die of cancer, thus swelling the cancer mortality.

2nd. That they might have died of an unknown cancer.

The first objection must readily be admitted, but taking into consideration that in a vast majority of

instances cancer is a disease of advanced middle life, it would be in only a small number of instances that the parents, if living, would eventually die of the disease.

As a proof of this, it will be found that in the whole series of Sir James Paget's cases only three instances are recorded in which a parent has succumbed to cancer subsequent to an offspring dying of the same disease; this amounts to less than 1 per cent. in the whole number of cases. The objection that the disease might have been an unknown cause of death would apply equally to the Registrar-General's returns, to be presently alluded to.

The figures given in Mr. Baker's table of Sir James Paget's cases will now be compared with those derived from the Register of St. Bartholomew's Hospital. From June 1869 (the first commencement of registration), till October 1878, 280 \* cases of cancer were under treatment in the female surgical wards. Of these 280 cases in 111 no family history of any kind is recorded; in the remaining 169 cases a special record is made as to the family history. In these 169 cases no cancer was known in the parents in 156 instances; in 11 cases either the father or mother had cancer; in 2 cases it was doubtful whether or not one of the parents had the disease, one of these being so doubtful that I have thought fit to exclude it. There will remain, then, 12 cases among 336 parents, or 1 case in 28.

As Mr. Baker very properly observes, in speaking of Sir James Paget's cases, these statistics in themselves do not prove in any way the inheritance of cancer, and this question can only be finally answered by discovering the proportion of cancerous relatives belonging to those not cancerous, and comparing the two sets of figures.

What we have to do is to compare the death-rate

\* Cases entered in the hospital index under the head of "Cancer" are alone included.

from cancer in the parents of cancerous patients with the death-rate from cancer amongst adults generally. Fortunately, in the Registrar-General's returns we have a means of making this comparison.

It would not be right in this calculation simply to take the whole number of deaths in the community and find out how many of these deaths were due to cancer, for the parents of cancerous patients must certainly have been adults at the time of their deaths.

The total number of marriages below the age of twenty only amounts to 8 per cent., and the proportion of these who both become parents and die below the age of twenty is so small a percentage that it can be fairly ignored. Thus, then, we will compare the death-rate from cancer in the parents of cancer patients with the death-rate from the same disease in all persons in the kingdom dying above the age of twenty years.

In the ten years, 1861 to 1870, in England and Wales—

1,185,189 men died above the age of 20 years.  
1,194,433 women died above the age of 20 years.  
24,845 men died of cancer.  
56,854 women died of cancer.

The addition of these figures gives 81,699 deaths from cancer out of 2,379,622, or 1 death in every 29·1 from cancer.

By comparing these figures with the figures given in the previous page, the following result is arrived at:

Amongst the parents of cancerous patients the death-rate from cancer amounts—

According to Sir James Paget, to 1 in 24·8.  
„ St. Bartholomew's Register, to 1 in 28.

Amongst the whole community over twenty years of age—

According to the Registrar-General, to 1 in 29.

The relative frequency of cancer in these two sets of cases differs so slightly that this difference may well be looked upon as accidental, in which case the figures given in the paper bear proof that cancer in the parent



does not increase the liability of the offspring to suffer from the same disease.

Statistics collected by other observers might lead to different conclusions. I have made every endeavour, however, to make the foregoing figures accurate, and until more evidence is adduced than is now accessible to prove the inheritance of cancer, I do not feel justified in admitting the doctrine as evidence of the constitutional origin of the disease.

**Recurrence after Removal.**—This, not merely *in situ*, but disseminated about the body, has been regarded as evidence of the part played by the constitution in the production of the disease. In speaking of this argument, Sir James Paget states :\* “I would hold that the constitutional element in the origin of cancer is strongly marked in the constancy and in the method of its recurrence after operations—recurrence after complete excision. . . . You may cut out little cancerous tubercles here and there from some old person three, four, five, or six times over, but that is a different disease. You cannot find an instance of rapidly growing soft-textured, vascular cancer of any form which can be removed three, four, six, eight, ten, or twenty times without recurrence, not in the place of growth alone, but in distant organs ; and I believe it is vain to attempt to explain this difference of the recurrence in distant and dissimilar parts which we find in recurrent tumours, or occasionally, in the more ordinary kinds, upon any facts of difference of physical constitution. I observe it is referred to the mobility of cells, to their readiness to travel, that now and then these tumours pass from one part to the other. Now, really there are cancers that multiply themselves in dissimilar parts whose physical condition looks as unfit for travelling as any that could be named. If I could name any kind of cancer which propagates itself more widely and readily than

\* “Path. Soc. Trans.,” vol. xxv.

another, it would be osteoid, a mass as hard as any mass of fibrous tissue you ever found in the uterus. I know no fibrous tumour which is so hard as the fibrous mass, to say nothing of the bony structure, of an osteoid cancer, yet it propagates itself speedily everywhere. Ordinary scirrhus cancer of the breast is at least as hard as an ordinary fibrous tumour; but the one does what the other does not—propagate itself. The recurrent fibroid, or recurrent cartilaginous growths, are just as soft, and are composed of cells and free nuclei as little held together as in any of the soft forms of cancer. They do not, except in rare cases, propagate themselves. Cancers do not fail, except in rare cases, to propagate themselves, so that I must maintain that, whichever way we look at them, the facts of the method of propagation to distant and dissimilar parts are so strong, and so characteristic on the side of cancers, that we must assume an essential difference between them and any other tumours that we can name.”

But yet this argument, when considered, amounts to no more than stating that there is a marked difference in the physical character of cancer and that of the innocent tumours, a fact readily admitted. If, however, it can be shown, as I will endeavour to show subsequently, that all the particles of the disease found disseminated about the body are the results of the primary tumour, and started from it, then, instead of the dissemination being an argument in favour of the part played by the constitution, it appears to point in an exactly opposite direction.

**Cancer following an Injury.**—In a certain number of instances the actual starting-point of cancerous growth appears to follow more or less directly an injury of the tissue, and this outbreak, known under the name of “traumatic malignancy,” results from injury of a peculiar nature and in certain parts. The form of injury that apparently starts the disease is not an incised, lacerated,

or punctured wound, but rather that form of injury known as "contusion," and this, too, often of a trivial nature. Again, the parts in which a malignant tumour follows a blow is generally glandular tissue, as shown in my notes of a case which was under the care of Sir. T. Smith, at St. Bartholomew's.\*

In this case the constitutionalists would see evidence of a constitutional tendency excited to activity from the injury, for they would say, and probably with truth, that ninety-nine such blows might be struck on as many individuals, without producing a similar result, and from this they would argue that there must be a second factor besides the blow to produce such an exceptional phenomenon, and in this factor they recognise a peculiar disposition in the constitution. If such an hypothesis be correct, it would seem that any blow struck on a patient with such a diathesis should be followed by tumour formation; but yet this is not the case, for wounds or contusions of innumerable kinds have, from time to time, occurred to persons who are actually suffering from cancer, yet, save in the rarest instance, no cancerous growth has resulted, unless the injury has occurred in the immediate neighbourhood of a primary disease. The late Mr. De Morgan narrates a case† which admirably illustrates this fact.

\* E. R., police constable, in June 1878, while arresting a prisoner, received a kick on the left breast; it was not very severe but caused him some pain at the time, and did not prevent his being on duty the following day. Twenty-four hours after the injury there was a bruise the size of a florin around the nipple. The marks of this remained for some weeks and then disappeared. Ten weeks afterwards he noticed for the first time some hardness round the nipple, about the size of a small marble. He treated this by fomentations and poultices, but it continued steadily to increase. On entering the hospital, rather more than a year after first noticing the growth, there was a large projecting tumour, the size of a foetal head; the skin over it was dusky in colour and firmly adherent, while in the axilla were two large glands the size of walnuts. He was a strong burly man, no family history of cancer, and had got rather stouter than thinner during the last six months, since he had been off duty. The tumour was malignant.

† A man was brought into the hospital with a compound fracture of the radius, which had occurred four or five days previously. The whole arm was enormously swollen and in a condition of what may be called

Now, I will readily admit that, seeing the exceptional nature of the constable's case, there must have been some condition in addition to the mere blow, to produce so untoward a result; but what I do deny is, that it is necessary to assume that the additional factor should lie in the patient's constitution at large, rather than in some local condition excited to activity by the injury to the tissue.

Having mentioned some of the chief arguments used by the constitutionalists to support their view of the origin of the disease, I will glance at those features which appear to me to supply the strongest evidence of its local origin, the constitution only becoming secondarily tainted.

*First.* Amongst these we have the evidence of the tumour itself, a single spot being alone affected, the rest of the body being in perfect health. In fact, the first indication of the disease is its local manifestation. As an instance, I will take a case\* which was under my

putrescent cellulitis. There was putrid pus and serum distending the cellular tissue up to the middle of the arm. The general appearance of the man, notwithstanding this, was regularly healthy. His pulse was 84, he had a clean tongue, and ate and slept well. I contented myself by making incisions, expecting that amputation might soon be necessary; by-and-by the carpal bones and the head of the radius became carious, many of the former were removed, the head of the ulna exfoliated. There was copious suppuration, at first foul but afterwards becoming healthy. During all this time, a period of a couple of months, he retained his health, eating, drinking and sleeping well, with a good colour and slow pulse. I determined to let Nature have her course. All at once he was seized with peritonitis. I feared it was pyæmic peritonitis, and that I had carried the experiment too far. He died, and it was found that the peritonitis was due to a portion of the gut having got entangled in a band, the result of a peritonitis which he had told us he had previously suffered from. But in addition to this there was found in the pelvis and lower part of the abdomen, a mass of colloid cancer, while the omentum and intestines were throughout studded with nodules of the disease of various sizes. There was no sign of cancer about the injured arm.—“*Path. Soc. Trans.*,” vol. xxv. p. 391.

\* A woman, aged forty-five, had enjoyed thoroughly good health since she was a child. A few months ago she began to feel slight discomfort in the right breast. This came on so gradually that she could fix no exact date for its commencement. A week ago she noticed for the first time a hardness in part of the right breast. She is still in perfect health and has no pain to speak of. On examination a hard nodule is felt deep in the breast, but no per-

care at the Royal Free Hospital, as being fairly representative of what is commonly observed.

When the patient was first seen her health was good, but anxiety of mind, sleepless nights, and pain soon told their tale, and accounted for the so-called cachexia. After the removal of the local disease she regained to a great extent her former health, only to be lost when the disease returned. Such a history is common in cancer, all the constitutional symptoms being consecutive to the tumour.

*Second.* The manner in which cancer spreads and propagates itself. There are four methods by which the disease extends. Three of these methods of extension are as clearly recognised, and as universally allowed, as any fact in pathology—viz., growth from the periphery, extension by the lymphatics, and dissemination in the course of the blood-stream. The fourth method is by auto-inoculation, but notwithstanding the utmost importance that should be attached to this method of extension, it is practically ignored by the majority of authors on the subject, although it has not escaped the observation of such accurate pathologists as the late Dr. Moxon, Dr. Goodhart, and the late Mr. De Morgan. Many museums afford specimens of malignant ulceration of the stomach with patches of cancer scattered here and there along the small intestines and colon. The appearance of these specimens combined with their clinical history leaves little doubt but that these deposits were

ceptible glandular enlargement. An operation was advised but declined. She again applied to the hospital four months later; her condition was then much altered, the tumour was larger and very painful, and in the axilla was a gland as large as a pigeon's egg; she had lost appetite and her nights were often sleepless. She had quite lost her good looks and complexion, her face being thin and careworn; she was very considerably thinner. Being very anxious for an operation the breast was completely removed, together with the axillary gland; the wound healed rapidly. She left the hospital in good spirits and during the next few months she regained her appetite and once more looked fairly healthy; unfortunately six months after the operation the disease returned *in situ*, she became rapidly cachectic, and, I believe, died eight months later.

secondary to the gastric disease. In the Middlesex museum is a cancerous ulcer in the stomach of a boy who had previously suffered from the same disease in the mouth. In the "Pathological Society's Transactions" it will be found recorded, and specimens have been exhibited showing how the uterus has become inoculated with cancer through the Fallopian tubes from a diseased ovary, how the lungs and bronchi have become infected from a primary cancer of the larynx, and how the skin of the abdomen has become cancerous from contact with a pendulous breast already diseased.

I have myself recorded\* a very remarkable case of this auto-inoculation. The patient was a woman in St. Bartholomew's Hospital, who had a cancerous ulceration involving the breast and skin of the thorax. For two months, being unable to put on any dress, she had kept her arm bent at right angles in constant contact with the disease; the result of this contact being that the skin in the neighbourhood of the elbow became the seat of a cancerous ulcer several inches in diameter.

As regards these four methods of extension, the first and last—viz., growths from the periphery and from auto-inoculation—afford positive evidence of extension by direct local infection, while the manner of extension by the lymphatic glands, and of dissemination about the body, leaves little question that the secondary points of disease are propagated from the primary tumour. The parts in which these secondary deposits first appear are almost invariably structures in direct communication with the primary growths, by means of the lymphatics and blood-vessels; thus, for instance, the glands of the axilla are first affected in cancer of the breast, the sub-maxillary in cancer of the tongue, and the liver-substance after disease of the intestine. Moreover, when it is remembered that one of the functions of both lymphatic glands and liver is to act the part of a filter—

\* "Path. Soc. Trans.," vol. ii. 1881.

the one to the lymph, the other to the blood—it would be expected that these would be the organs in which morbid material would first become arrested. But after a while, the glands and the liver becoming disorganised, they are no longer able to filter out the obnoxious particles, and thus, eventually, general dissemination occurs by the blood-stream.

The whole course and progress of these secondary growths can at times be as clearly traced from the primary tumour as can the abscesses of pyæmia from the original scratch on the finger.\*

When we see the manner in which malignant disease spreads, it is impossible not to be struck with the close analogy it bears to any poison introduced into the body locally, such, for instance, as the poison of septicæmia, glanders, or syphilis. The constitutionalists, admitting the extension of cancer by the channels mentioned, see in it only another proof of a “predisposition,” they say that a something is absorbed that irritates a gland, and this irritation, instead of subsiding or going on to the formation of an abscess as it would in an ordinary case, excites the formation of cancer owing to the predisposition to that disease inherent in the patient. Sir W. Jenner expresses this by saying that† “something is absorbed, it is not necessarily pus, there is a disposition in every part to burst forth into cancer, when an exciting cause

\* A patient, a healthy woman, aged twenty seven, had upon her right leg a small dark-coloured mole which had been there since her birth. A year previous to admission into the hospital a small warty excrescence appeared on one part of the mole. This she treated with caustic, which in a few days was followed by some tenderness of the groin below Poupart's ligament. In the course of a few weeks a tumour made its appearance in the groin at first no larger than a nut; other swellings soon appeared both above and below Poupart's ligament, and also in the popliteal space. Each of these soon developed into well-marked tumours. After the lapse of nine months from the first application of caustic, tumours had appeared over the clavicle, sternum and abdomen, while there were obvious symptoms of tumours in many internal organs. She was removed by her husband from the hospital in a dying state, eleven months after the application of the caustic. No opportunity was afforded for a post-mortem examination.—Sitwell Ward Register, St. Bartholomew's, vol. vi. (Notes by H. T. Butlin and author.)

† “Path. Soc. Trans.,” vol xxv.

is applied; something is absorbed from the part which irritates a gland, and in the constitutional state of the patient, cancer is produced instead of abscess or extravasation of blood, or thickening of a tissue. Whether it goes by the lymphatics or the veins is a matter of insignificance; it would not develop into cancer unless you had a primary condition in the patient—viz., a disposition under irritation to form cancer.”

Yet it would seem to me as reasonable to hold that the disseminated abscesses of pyæmia or the tertiary gumma in syphilis were due to predisposition in the constitution of certain individuals to form such masses “under irritation.” But no one for a moment doubts that the characters of the secondary effects of pyæmia and syphilis are stamped not by the constitution of the patient, but by the specific nature of the original poison.

Again, if further proof of the direct relationship of the secondary deposit to the primary tumour were necessary, it is afforded by microscopic examination from such deposits, for the peculiarities of their structure often admit of their being identified as starting from the primary tumour. If, for instance, the primary tumour have cartilaginous nodules in its substance, portions of cartilage may frequently be found in the secondary deposits, while in cancer of the liver, secondary to the same disease in the rectum, not only can the large epithelial cells of the rectum be recognised, but they actually attempt to develop into an adenoid growth, having all the characteristics of Lieberkühn’s follicles.

Certain local applications have the undoubted property of exciting malignant growth; the example of this is to be found in chimney-sweep’s cancer of the scrotum.

It can scarcely be contended that sweeps have a special constitutional tendency to cancer. It must, therefore, be acknowledged that it is due to an irritant locally applied. The question would further arise as



to whether this cancer of the scrotum is caused by any specific irritation inherent to soot, or whether any irritation constantly applied to the skin of the scrotum will produce similar results. Now, seeing that there are many forms of manual labour by which the parts in question are kept constantly irritated by dirt, yet the impunity from cancer in these circumstances points rather to some specific irritation due to soot; possibly the exceeding fineness of the particles may afford an explanation, but I will not venture at present to speculate on this matter. The fact, however, and that too of the greatest importance, remains, that a local irritant can produce what is at first certainly a true local disease. In this form of cancer the commencement of the disease is almost obvious, its gradual progress can be traced until neighbouring glands become implicated, and the patient ultimately dies of the disease. It is, too, in this class of case that the sufferer, being aware of the nature of his malady, applies for advice at an early stage, and the surgeon operates with a fair hope that the cure may be permanent.

When there is such positive evidence that the disease is local in a particular case, and when there is no proof that it is due to a constitutional origin, it is more logical to assume that the disease always has a local though unknown cause than to regard as of an exceptional nature the cases in which local origin is obvious.

Taking into consideration the points in the history of cancer upon which we have already touched, it would seem that the preponderance of evidence is strongly in favour of the view that the origin of cancer lies in some local condition of the part attacked. With a view to ascertain the cause of the disease, it is natural that pathologists should have paid considerable attention to the structure of the growth itself; but yet, in studying the histology of the tumour, we are rather examining the product of the disease than investigating its cause.

What the surgeon removes, and the microscopist cuts into sections, cannot be the cancer, that is to say, the whole cancer. This seems pretty evident by the disease remaining in the patient and ultimately causing his death. What has been removed consists of a mass of hypertrophied tissue and cellular element formed as the result of a disease, portions of which have most certainly been left behind. No doubt that part which appeared to be acting most violently had been removed with the tumour, but what remained behind only required time to increase and to become as active as the part already removed.

The careful study of the tumour itself by the microscope has in a way greatly increased our knowledge of the disease, and supplied us with a vast amount of valuable facts; but yet I doubt whether, by the study of the tumour alone, the true cause of its growth will be eventually established; certainly, if for our knowledge of pyæmia we had been dependent upon the microscopic examination of the secondary abscess, we should never have attained to the knowledge which is now so successfully employed in guarding against the disease.

If the tumour be cut into sections and examined, it will be found that there is nothing mysterious in the elements of which it is composed. The cells which represent the growing part of its structure are similar to those naturally existing in the part affected, and, moreover, often have a tendency to form themselves into glandular tissue, with a structure more or less in imitation of the healthy glands in the immediate neighbourhood. The source from which the cells forming the tumour are derived would seem to be almost certainly the pre-existing cells of the part, and are the result of a proliferation of the lymphoid and epithelial cells previously existing in the healthy tissue. Since it is the accumulation of these cells that forms the tumour, it is to the cause of this accumulation that attention should be directed. In searching for this we will briefly consider what causes

are already known as leading to unnatural cell aggregation.

Simple mechanical irritation, such as results from friction or intermittent pressure, will lead to cell growth; and of this we have a typical example in the formation of corns and bunions.

Again, the presence of a foreign body in the tissue will lead to a local hyperplasia, such as is seen in the hypertrophy of bone, when a sequestrum long remains enclosed in its cavity.

Lymphatic obstruction is considered by some to be a cause of cell overgrowth.\*

Another group of causes is to be sought in certain specific inoculations; for instance, vaccine lymph will in a few days lead to an extensive effusion of leucocytes. Here the manifestation is local, so far as the cell collection is concerned. In the same category may be included the poison in pyæmia, but this not only produces a primary abscess (cell collection), but also by means of the lymph and blood-channels will cause secondary formations of pus wherever arrested. Other instances, such as inoculation in small-pox, might be cited, but sufficient have been mentioned for purposes of illustration. Such causes, moreover, act more or less acutely, and the cellular product takes the form of pus, being formed too quickly to become organised into fixed tissue.

Such an accumulation is like a quickly collected, unorganised mob, the individuals of which act independently. In the haste of their collection the commissariat has been neglected. The capillary blood-vessels, which should supply the lymphoid cells with food, have had no time for development. The collected cells are consequently short-lived, and soon become little more than dead refuse. Regarding pyæmia and small-pox then as examples of rapid cell effusion from a specific cause, we will pass on to some specific poison,

\* Holmes's "System of Surgery," third edition, vol. iii. p. 579.

which both locally and secondarily will produce a cell formation, having sufficient vitality and blood supply to allow of its formation into cohesive tissue. Of this we have an admirable example in syphilis.

In descending the scale of creation we find the vegetable kingdom rich in examples of cell formation due to specific irritation. Those who have studied the formation of galls, will know how these bodies are produced by such irritants.\*

Here we have a tumour formation, the individual cells of which are derived from the bark or leaf on which it is placed, and can be easily identified with the cells of the neighbouring normal tissue; but yet it is established beyond doubt that this extraordinary behaviour of a portion of a tree is the result of a specific irritation, which in the case of the oak-tree is an insect (the *Sineps quercus folii*).

In considering whether any of the causes just mentioned bear upon the question of malignant tumour, the "mechanical irritation" will first come under consideration. It has frequently been sought to prove that mechanical irritation is the source of cancer, but as yet with entirely negative results.

Patients with cancerous ulcerations on the lips or tongue are invariably questioned as to smoking, or as to the existence of broken teeth. Affirmative replies are considered evidence of a connection between the irritatives and the morbid growths. If these relations be regarded as cause and effect, why should the cause be at work in 1000 cases, the effect following in one only? Instead, therefore, of such irritations being the cause of morbid growths, we have overwhelming evidence that they are not so, save in the rarest instances.

Without denying the connection that occasionally exists between injuries and malignant growths, it is

\* Sections of Galls, "Path. Soc. Trans.," London, vol. xxxv. (Paper by Author.)

evident that the determining cause must lie in some factor beyond mere irritation, and, as already mentioned, the constitutionalists with unscientific vagueness regard this factor as a "constitutional predisposition," so that, instead of the irritated part producing a simple hypertrophy or abscess, a malignant tumour results.

Simple mechanical lymphatic obstruction might account for the formation of a local tumour, the cells formed in a given part being unable to pass away, but such obstruction must either lie between the tumour and the nearest glands, or beyond the glands. In the former case the glands could never become diseased, in the latter it should be the primary seat; both of which are contrary to fact.

Lastly, we will consider specific infections as a cause for cell accumulation, and herein we find an analogy closely resembling what is seen in malignant disease. The poison of small-pox or glanders not only produces the cell accumulation at the seat of the inoculation, but passing by the lymphatics and blood-stream causes secondary accumulations in various parts of the body. Syphilis runs a similar course, merely differing from its action being slower. In these instances the medium by which the poison travels from the seat of inoculation is not determined; it may be that the germs (*Bacteria*) are simply washed along the channels, or they may be carried along in the interior of the leucocytes coming from the infected part.

In cancer, however, we can go further, and can prove almost certainly that the infection, whatever its nature, is carried by, or resides in, cells derived from the neighbourhood of the original disease. It is found, for instance, that the secondary deposits in the liver, when following rectal disease, can not only be identified as consisting of the columnar cells of the rectum, but that they actually in the liver grow into a gland tissue identical with Lieberkühn's follicles of the rectum.

Accepting it then as a fact that the secondary deposits found in the liver after rectal cancer are formed from cells originally derived from the rectum, what a field for inquiry is immediately opened. Is it to be supposed that it is only in disease that cells derived from the intestinal glands find their way to the liver? or is it but part of a normal physiological process that cells should thus migrate? This question is more fully considered on p. 16, and, as the result of the microscopic examinations there described, I venture to suggest that each of the epithelial cells of the intestine represents an individual life; requires nourishment, grows, and multiplies by the division of its nucleus, which nuclei from time to time find their way into the subjacent retiform tissue, pass hence through the lymphatics to the blood stream, where they become identical with the leucocytes. Should this view be correct, or even partially so, we have a solution to the surprise that is first experienced on recognising a structure peculiar to the rectum transplanted to the liver.

Such cells, unable from their altered form, due to a diseased condition, to pass readily along the usual channels, collect first in the sub-mucous tissue, and subsequently in the liver or lymphatics, thus producing tumours, while at the same time it is more than probable that they may infect the cell elements of the part in which they are arrested. Let us for a moment compare this theory with the interpretation of facts suggested in the study of primary rectal growth. Lymphoid cells, offspring of the glandular epithelium of the intestine, are infected with the disease at birth. The function of such embryonic cells, if healthy, would have been to have passed through the lymph channels into the blood, and there to have circulated until required by some particular portion needing their assistance for repair, but owing to their alteration by disease they not only have great difficulty in passing along the lymph paths,

but when they succeed in doing so have a tendency again to become arrested in the fine structures of the glands. In the first instance their undue sojourn in the lymphatics in the immediate neighbourhood of their birthplace gives them time to develop into the more perfect type of cell, or even to a tissue similar to that formed by their parents, and the same development taking place when arrested in distant parts causes the formation of secondary growths.

The nature of the irritant infecting the cells is unknown, but seeing the increased prevalence of malignant disease in certain districts, it would appear to be from some cause originating external to the body, and to have a special affinity for certain structures, such as gland tissue, in the same way as particular galls only infect the leaves, bark, or root of the plant, according to their special variety.

The undoubted starting-point of malignant growths, especially in glandular structures, can from time to time be directly traced to some blow or injury, yet, as a rule, thousands of such blows or injuries may occur without being followed by any such result. But we can study an almost analogous process in the acute necrosis affecting the bones of children.

Hundreds of slight contusions of the periosteum may occur without producing acute pyæmic necrosis, but yet the starting-point of this grave disease can at times be clearly traced to such an accident. If the product of one of these acute abscesses be examined it will be found crowded with organisms, notwithstanding that no communication with the air previously existed.

Such a phenomenon can, I think, only be explained upon one hypothesis—viz., that such organisms, by absorption, find their way into the blood, and whilst still circulating within the healthy tissue are incapable of multiplying or doing harm, but when in damaged tissue they become stationary by extravasation as the

result of a blow, they immediately become active, and produce the phenomenon of sub-periosteal abscess or pyæmia.\*

In cancer no parasite has been discovered by the microscope, but this is no evidence whatever of its non-existence, for it must be borne in mind that it is only within the last few years that even the larger microscopic organisms have been detected, and some of these would never have been suspected had not their movements attracted attention in recent specimens. The myriads of minute specks of granular material seen by the microscope, when examining a section of malignant disease, might contain any amount of organisms which, at present, are incapable of recognition.

Since writing the foregoing in 1880, some most valuable investigations† with a view to the discovery of the cancer organism have been carried out by Messrs. Ballance and Shattock, D'Arcy Power, and others. At present their experiments have led to a merely negative result, but such accurate and patient work will doubtless clear the way for future investigation.

If cancer could be propagated from one person to another, it would support the view that one of its causes may lie in some specific contagion. Hitherto, all direct experiments with a view to inoculation have failed; but yet, when we read the accounts of these experiments, they merely prove that when a portion of a tumour, or of its secretion, is inserted *beneath* the skin of an animal, the results are negative. If portions of the disease could be kept sufficiently long in contact with an *epithelial*

\* Some time after advancing the above theory as to the cause of pyæmic abscesses occasionally following blows, the view has been confirmed by actual experiment. Rocher performed the following experiment. Healthy dogs were fed on the flesh of animals dying from septicæmia, with no apparent deleterious effect. The periosteum in some of these animals was subjected to contusion without any skin wound being made. Abscesses of a pyæmic nature rapidly developed at the site of injury, the animal dying subsequently of general septicæmia, the original abscess being crowded with organisms.

† "Path. Soc. Trans.," London, vols. xxxviii. and xxxix.



structure, there is reason to suppose that inoculation would take place. Such an experiment is occasionally carried out by nature, as in the instance narrated on p. 31. The fact that when sound epithelial tissue is kept in constant contact with malignant disease, it becomes infected, lends no small support to the view that the poison in at least some cases of cancer may prove to be of a parasitic nature.\*

\* The foregoing chapter was written sixteen years ago for the third edition of this book. Since that date many of the ablest minds of the day have been working constantly on this subject, but still the practical advance in the knowledge of the causes of cancer have been very small, the most important being the demonstrations by Professor Jensen of Copenhagen, that the disease can be transmitted to animals by inoculation. In this country, admirable work has been done by Dr. E. F. Bashford, of the Cancer Research Laboratory. Under his able directorship, a large mass of facts have been carefully collected, the analysis of which will surely bear fruit in the near future.

## CHAPTER III

### **PATHOLOGY OF RECTAL CANCER**

I NOW pass away with some satisfaction from the unsafe region of theory; for I feel that this problem of cancer is not to be solved by speculation on ill-considered hypotheses. Physicians from the earliest dawn of medical science have been busied in speculating on this problem, and yet have scarcely advanced a step in its solution. In recent years some progress has been made in our knowledge of the structure of the tumour, but such knowledge has only been arrived at by the aid of microscopic examination. If knowledge of the disease is to advance, it will be by the continuation of this process of investigation, aided by clinical observations and accurate experimental research. With this view, in the following pages I will give the results as briefly as possible of the histological characters of malignant growth as found in the rectum. The observations made are fragmentary and imperfect, but I venture to give them in order to compare notes with other workers in the same field.

Malignant disease of the rectum has enjoyed its full share of classification. Its nature has been described under the heads of scirrhus, medullary, and epithelial cancers, sarcomas, round and spindle-celled, myxomas, adenomas, &c., while the innocent tumours have been described as villous growths, papillomata, and polypi.

The older writers founded a simple classification,

according to their clinical experience, of these growths, and were content with two varieties—cancer (malignant growth) and polypus (an innocent formation). This classification into simple or malignant growths is of considerable clinical value, but it assumes too much, and draws too hard a line between the two varieties of tumour. For, notwithstanding that, in a large number of cases, the future of the disease can be certainly predicted, there remain a certain number of growths whose malignancy is of such a modified type that it is impossible accurately to forecast their future behaviour. They form, as it were, the connecting link between the malignant and innocent disease, but yet are not provided for in either nomenclature.

Recent attempts to define these growths according to their minute anatomical structure are certainly more scientific, and, if only accurate, would form no cause of complaint. In the rectum, however, to which the present observations are confined, I have failed to discover any growths or tumours consisting entirely of the characteristic structure which pathologists designate as scirrhus or medullary cancers, or as belonging to the different varieties of sarcoma, with the exception of melanotic sarcoma of anus.\*

Considering the eminence of many careful observers†

\* *Case of Melanotic Sarcoma of Rectum and Anus.*—Marian H., aged thirty-nine, admitted into President Ward, St. Bartholomew's Hospital, May 16, 1895. For the last six months noticed some blood with the motions, and pain at the anus. Three months ago, for the first time, when straining at stool, "a lump came down," and has done so each time she goes to stool ever since. A few days ago she could not return it, and was admitted into the hospital. Examination showed just within the anus a hard movable mass the size of a big walnut, projecting into the bowel, and two or three black growths the size of peas just at the anal margin, but not connected with the larger tumour. The nodules and larger tumour were removed in one piece. The tumour had a papillomatous surface, and was almost black in colour, but soft to the touch. Microscopic examination showed both the large and small tumours to be melanotic sarcoma.

† Dr. Ball, of Dublin, in his work, "Diseases of the Rectum," p. 219, states that in the Museum of the College of Surgeons of Ireland are two specimens of sarcoma of the rectum. He also records an interesting case of melanotic sarcoma under his care.

who have applied such names to these growths, it would be quite unjustifiable to assume that such distinctive structures never form the entire bulk of the tumour; but I feel bound to state that with, perhaps, a more than average opportunity of examining such growths from the rectum, I have been unable, with the exception of melanotic sarcoma, myself to discover tumours composed entirely of the distinctive features appertaining to these diseases.

It must not be supposed that all these growths have a similar structure. On the contrary, it is seldom that any two accurately correspond in their construction, but such differences as exist depend rather upon the details of the growth than on any difference in the general plan on which it is formed. The length of time that the tumour has existed, the particular tunic which it has invaded, or the portion of growth from which the section has been cut, are sufficient to account for the varying appearances obtained by the microscope without the assumption that different types of the disease exist. For instance, I have seen growths which, while confined to the mucous membrane, displayed the most typical microscopic characteristics of adenoid or cylindrical cancer, yet, when they had spread to the skin of the anal margin, they gradually and imperceptibly changed their characters into perfect examples of epithelioma as it ordinarily affects the skin (*see* Plate XIII.). It not uncommonly occurs that the particular features supposed to be characteristic of each type may be observed in the several portions of the same specimen, or that a tumour which, on its original removal, presented one variety, will on its recurrence present another.

Excluding the form of cancer known as colloid, as to the nature of which I am not altogether satisfied, it will be found that there is one characteristic structure common to almost all morbid growths in the rectum. This structure consists of gland tissue similar to

Lieberkühn's follicles. By careful examination this tissue can be demonstrated in almost every specimen, but yet now and again search fails to disclose this gland tissue. These exceptional specimens usually present dense fibrous tissue, with only a small amount of cell element; but a considerable amount of such structure is always found in the older parts of typical glandular growths, where it can be demonstrated to be in direct continuity with, and to be formed from, the adenoid tissue. It is probable, therefore, that in the exceptional specimens either glandular growth existed in other portions of the specimen, but escaped detection, or that it had been present in an earlier stage of the growth, but had passed away before the specimen came under examination.

If these growths are to be named according to their anatomical structure, the term adenoid will appear to be the most applicable.

Such expressions as malignant, semi-malignant, or simple adenoid, would, moreover, be sufficiently distinctive for surgical purposes, and at least have the merit of being in accordance with clinical and histological observation.

It is generally easy for a surgeon of experience to determine, as the result of clinical observation, whether a growth in the rectum be of an innocent or of a malignant nature. Occasionally, however, the characters of the disease are not sufficiently marked to admit of a positive prognosis. The quickly growing tumours, or those which have deeply eaten into the surrounding texture, are almost certainly malignant, while the more slowly developed growths projecting into the rectum, without extending into the deeper tissues, are generally innocent.

Growths will be found occupying, as it were, a position in regard to their clinical features midway between the extremes mentioned. Such growths admit only of approximate prognosis, as their features tend

more or less in the direction of the innocent or malignant type.

Seeing thus, that from clinical observation it is possible to speak with considerable certainty as to the future of rectal growths, the question naturally arises whether the anatomical structure when examined by the microscope presents any constant appearances by which a malignant may be distinguished from an innocent tumour.

Although, as before stated, these growths are all constructed upon the plan of glandular tissue, yet I have no hesitation in affirming that it is generally possible to find appearances presented under the microscope by which the innocent or malignant nature of the growth can be established. However, just as in clinical observation so under the microscope, there will still remain specimens in which the structure presented lacks the distinctive feature common to either of the pronounced types.

In commencing a description of these growths it may be well briefly to call attention to the typical appearance both of an innocent and malignant specimen without attempting to describe intermediate links.

The innocent growth forms a soft tumour projecting into the cavity of the bowel. It sometimes has a fairly marked pedicle, especially if the growth has existed any length of time, but this pedunculated appearance is generally produced by the mass being constantly dragged upon during efforts of defæcation, and thus drawing down the healthy mucous membrane around the base of the growth so as to produce the appearance described. These growths are described in the chapters on Polypus and Villous Tumour (Chaps. XIII. and XIV.) in my work on "Diseases of the Rectum."

The malignant growths present two well-marked varieties, the chief characteristic of the one being its tendency to spread as a thin layer between the mucous and muscular coats of the bowel, while that of the other

is to increase more uniformly in all directions, thus producing a distinct tumour.

The laminar form of disease is the commoner, and when well marked exists as a thin layer of adenoid growth spreading in a horizontal plane between the mucous and muscular coats. The thickness of the growth is often not more than a quarter of an inch, while its area may extend over several square inches. At an early stage it feels like a flat foreign body between the mucous and muscular coats, slightly more raised at the centre than towards the circumference. The mucous membrane is firmly attached to the subjacent growth, while this in its turn is adherent to the muscular coat; it appears, in fact, as if the inter-fibrous bands naturally running from one coat to the other, had been rendered tight by the deposit of new growth between the fibres. The diseased portion of bowel is, as a whole, at first fairly movable upon the surrounding structures.

As the layer of the disease spreads it is not always in a regular manner; it usually extends more rapidly laterally than in the direction of the long axis of the bowel. The result of this lateral extension is often seen by the whole circumference of the bowel being affected, while the width of the ring of disease is less than an inch. It is this form of disease which constitutes the annular malignant stricture so common in the large intestine, and most pathological museums afford specimens of this annular form of cancer.\*

The deposit having existed a certain length of time ulceration of the mucous membrane over its centre takes place, and the membrane is generally slowly destroyed from the centre towards the circumference. Sometimes the ulceration of the mucous membrane commences at many points at once, so as to give it a honeycombed

\* In the Middlesex Museum will be found two beautiful specimens; they stand side by side, and are numbered 116 and 117, Series 8.

appearance, and the growth can be seen projecting through these holes in the mucous membrane (*see* Fig. 3, p. 51), but this is not common. After a while, instead of the centre of the growth being its most prominent part, it becomes excavated and depressed by the ulcerative action that commences in the mucous covering and extends to the disease, which in its turn becomes eaten away. At first the base of the ulcer will consist of the adenoid growth; as this gets completely destroyed the base of the ulcer is formed by the remains of the muscular coat, generally blended into a firm, hard cicatricial tissue. The dense mass thus formed appears to be in great measure due to inflammation set up beneath the ulcerated surface, for under the microscope it resembles an inflammatory rather than a malignant deposit. Towards the edge of the ulcer the new growth, with the hypertrophied disintegrating mucous membrane lying over it, is apparent. The edge of the ulceration is hard and raised, and often overlaps the healthy mucous membrane. It sometimes happens that after the destruction of the mucous membrane, instead of the subjacent adenoid growth sharing the same fate, it continues to increase, especially at certain points, and projects as a fungoid mass into the bowel cavity.

On section the borders of the diseased patches will be found raised a quarter of an inch above the level of the neighbouring bowel, overlapping the surrounding healthy membrane to a considerable extent. This heaping up is caused by a soft, flocculent-looking growth in the submucous tissue.

The portions of the muscular coats subjacent to the diseased mass are considerably altered. They appear at first sight to be greatly thickened and intersected by dense, glistening, fibrous bands. These bands blend in a dense mass of cicatricial-looking fibrous tissue, situated external to the muscular coat, and thick bands again pass out from this and are continued



into the surrounding fat, being imperceptibly lost by a gradual blending with the natural fibrous stroma of that tissue.

On a more minute examination the mucous membrane on the portion destroyed by ulceration is found thickened by a large accumulation of hypertrophied papillæ, looking much like the circumvallate papillæ of the tongue, giving a villous velvety appearance to the membrane. Beneath this hypertrophied membrane is a large quantity of retiform tissue, in the deeper portion of which is found the new adenoid growth, consisting of a soft, caseous material, dipping down here and there a considerable distance towards, and even between, the muscular fibres (*see* Plate I., Fig. 4.) The portions that dip down are seen to lie between the glistening white fibres already alluded to as intersecting the muscular coat. These dipping portions sometimes expand at their extremities so as to have the appearance of inverted flasks, and in places are distinctly lobulated. The little masses are only loosely adherent to the walls of the spaces in which they lie, and when picked out with the point of a needle the cavities in which they were contained are smooth. The boundaries of these cavities are the glistening fibrous tissue before mentioned (Plate VIII., Fig. 1).

As the adenoid growth extends downwards, it takes the place, and causes the absorption, of the bundles of muscular fibres lying between the fibrous trabeculæ; the trabeculæ themselves, however, instead of being destroyed, appear to become greatly thickened.

Beneath the central or older portions of the growth, the muscular coats are replaced by dense white fibrous tissue, the result of enormous thickening of the natural fibrous tissue between the muscular fibres. The thickened fibrous tissue extends beyond the muscular plane, and branching into the surrounding fat blends with its fibrous



FIG. 3.



**MALIGNANT TUMOUR OF THE INTESTINE.**

A malignant tumour, which has raised the mucous membrane and projects into the cavity as a nodule the size of a pigeon's egg. On the surface of this nodule the mucous membrane has been destroyed in two small circular patches, one the size of a sixpence, the other about a quarter as large. At these spots the growth, relieved from pressure, slightly projects, but is rather smooth than fungating. There are two smaller nodules in this specimen about half the size of the one described; over these the mucous membrane is still intact.—Drawn from a specimen in the Royal College of Surgeons' Museum.

*To face page 51.*

stroma. These branching fibres undergoing contraction draw the fat and neighbouring tissues towards the diseased portions. If an attempt be made to dissect the coats of the rectum, the one from the other, in the neighbourhood of the disease, it will be found scarcely possible to do so, for each coat seems firmly blended to its neighbour by the great thickening of the connecting fibrous bands.

What has just been described is the appearance seen on section of that form of disease which tends to spread horizontally. We will now consider the disease when it forms more or less a distinct tumour. This second variety commences in a similar manner to the one just described, that is, as a deposit between the mucous and muscular coats. The deposit is generally at a single spot, but there may be several nodules sprinkled over a considerable area. Instead of the growth extending in a thin layer between the coats it increases in size pretty regularly in all directions, and forms a distinct oval or circular tumour projecting into the bowel cavity. Such a nodule may attain the size of a pigeon's egg, or even larger, yet still retain an intact mucous membrane over its surface. But the mucous membrane will, after a while, give way (*see woodcut*), and the growth, released from pressure, quickly forms a fungating mass projecting into the rectum.\* These tumours vary considerably in their consistency, some being so soft as to break down on the slightest pressure, while others are fairly firm.

\* Specimen 1217, Royal College of Surgeons, is a good example of this form of growth at the time when the mucous membrane is just giving way. There is a tumour, which has raised the mucous membrane and projects into the cavity as a nodule, the size of a pigeon's egg. On the surface of this nodule the mucous membrane has been destroyed in two small circular patches, one the size of a sixpence, the other about a quarter as large. At these spots the growth, relieved from pressure, slightly projects, but is rather smooth than fungating. There are two smaller nodules in this specimen about half the size of the one described; over these the mucous membrane is still intact. In the same museum will be found a specimen, No. 1221. This specimen (or rather specimens, for there are two in the bottle, the second and most interesting being placed at the back, so that it cannot be seen without turning

It will generally be found that the firmness of the tumour is in inverse proportion to the rapidity of its growth. Some of the rapidly growing tumours are so fragile that they fall to pieces on the slightest manipulation. On section of the firmer growths, bands of fibrous tissue can be distinctly seen by the naked eye. Such bands are scarcely visible in the softer growths.

It may be gathered from this sketch of the naked-eye appearances of adenoid rectal disease how different the appearance under the microscope would be according to the portion of the growth examined and the length of time it had been growing. Sections involving the older portions of the disease, and in which the adenoid growth has been destroyed by ulceration, would show little more than dense fibrous tissue, the result of a preceding active condition of disease, while sections from the margin would show the cellular growth, in varying stages of development towards adenoid structure, according to the rapidity of the growth.

In order to understand the appearances found in the morbid bowel, it is desirable to trace the disease from its very commencement, and follow its progress step by step.

Unfortunately the cases are rare in which the growth can be discovered at an early stage, and rarer still that

the bottle round) shows two forms of the disease in the same intestine. It is described in the catalogue as "a portion of the jejunum, on the inner surface of which is a flat tumour, superficially lobulated, occupying the whole circumference of the intestine for about two inches wide. The tumour has a soft obscurely fibrous structure, and part of the surface is ulcerated. On another portion of the same intestine a smaller nodule has been cut through, and its section presents a soft surface with long threads hanging from it." This nodule, which is as large as a plover's egg, projects into the bowel cavity like the half of a sphere. The peritoneal surface of the bowel is quite level and not pushed out by the growth. The mucous membrane is perfectly intact over the tumour: on section it looks like a collection of exceedingly fine vermicelli crowded and squeezed together; here and there a loop or end of one of these has been drawn out from the cut surface and hangs down like a fine coil of thread over an inch in length. Upon further examination, they are apparently enormously lengthened villi crowded and pressed together, but not adherent. Some of these are two inches in length, but retain a uniform thickness throughout.

opportunity is afforded for microscopic examination. There is no reason, however, to doubt but that the condition of the tissue found towards the advancing margin of the disease would supply good evidence of the condition we should have expected to have found at the precise spot where the disease commenced. In support of this view I have by me a specimen in which the disease had only existed a few weeks, and its section has much the same appearance as seen in sections cut near the border of more advanced disease. In this specimen the disease had not advanced farther than the development of a portion of mucous membrane, a quarter of an inch in diameter, into a villous-like structure, while the subjacent retiform tissue was considerably thickened and crowded with lymphoid cells, the muscular coat being normal. The evidence afforded by this specimen, together with others at a more advanced stage, shows that the morbid action commences in an increased activity of growth in a portion of the mucous membrane.

Having briefly considered the naked-eye appearance of the growth, the use of the microscope is necessary for its further elucidation. The powers I have found most convenient in examining sections under the microscope are a one-inch for a general view of the section and one-ninth for studying the same in detail. Satisfactorily to understand the position of the growth relative to the natural structures of the part, the composition of its elements, and its method of extension, it is necessary to examine many sections cut from different portions of the morbid mass. The appearances presented by such sections will vary greatly, not only according to the portion of the growth from which the section has been cut, but also according to the variety of adenoid disease from which it has been selected.

The drawings illustrative of this portion of the subject

are from sections chosen from many thousands cut from different portions of sixty separate specimens. I have taken every care to draw the specimens exactly as they appeared in the field of the microscope, and the lithographs are exact copies of my drawings.

Plate IV. represents a section of the laminar form of disease. It has been cut at right angles to the bowel cavity, close to the margin of the growth, before the superjacent mucous membrane had been destroyed by ulceration. The section displays the mucous membrane and the new adenoid growth in the submucous tissue. The follicles in this portion of mucous membrane are three or four times their normal length. Their diameter, however, is but slightly increased, their lining epithelium is large, the boundary line between the cells being very clearly defined. The bed of retiform tissue upon which the blind extremities of the follicles rest is enormously increased in thickness, and it is in this bed of tissue that the new adenoid growth is apparent, but, as seen in the figure, there is considerable distance between the bases of the normal follicles and the new glandular growth, the intervening space being crowded with a mass of small cells. There is no clear line of demarcation between the lymphoid cells of the submucous tissue and the new adenoid growth. At the upper portion of the section the submucous tissue appears crowded with the simple lymphoid cells; in the lower portion most beautiful glandular tissue can be seen almost as perfect in its formation as the normal Lieberkühn's follicles. The change from the lymphoid cells to the gland tissue is by imperceptible degrees. If the lymphoid cells be followed downwards towards the growth, they appear as if they slowly change their character from a simple lymphoid into an epithelial type of cell. It looks, indeed, very much as if the small lymph-cells gradually surrounded themselves with protoplasm, and thus became the nuclei of epithelial cells. Anyhow, the more nearly they

approach the growth the more epithelial is their character. Almost immediately after the epithelial type of cell can be recognised small embryonic-looking portions of gland tissue can be seen. These little bits often consist of four or five embryonic-looking epithelial cells arranged in a cluster. At first the acini are difficult to make out, owing to their being irregularly and indistinctly marked, but they gradually merge into the perfect and regular adenoid structure seen in the plate.

This adenoid tissue, as seen on section (Plate VIII., Fig. 1), consists of a series of cavities divided from one another by fibrous tissue. In some places the fibres of this tissue are close together, forming dense bands. In other places they open out, forming a loose retiform network. The cavities vary in shape from perfect circles to long irregular channels with various inlets. These spaces are lined with a single layer of epithelial cells. The bases of these cells rest upon the fibrous or retiform tissue before mentioned, while their apices look into the cavity. Cavities, however, do not always exist; they are exceptional, for it seems that the apices of the cells covering one wall of the cavity are in contact with the apices of those of the opposite side. In some instances the cavities are obliterated by the opposite walls coming into contact as if from external pressure; in others they become filled by offshoots growing from the epithelial boundary of their walls.

These offshoots frequently show a beautiful tree-like arrangement, the original stalk throwing off secondary and tertiary branches. The stalk and branches consist of retiform tissue, the surface of which is covered with epithelium (Plates V. and VII.). In this way the interior of many of these cavities is completely filled with adenoid tissue. However complicated be the pattern formed by the crowding together of these branches or convolutions, every branch, whether it be primary, secondary, or tertiary, will consist of its central stalk of retiform



tissue, upon which the epithelium is arranged in a bipenniform manner—*i.e.*, bipenniform as seen on section, for if the whole thickness of the branch could be seen it would, of course, be entirely covered by epithelium. In examining the tumour as it extends into the deeper tissues, it must be remembered that it is not merely the new growth that is seen, but it is the new growth *plus* the remains of the old normal structures into which it is growing, and partially displacing. Thus the growth has not the same regularity of structure as when growing unimpeded on the surface. Here and there bands of thickened fibrous tissue can be seen, which represent the connecting links which normally exist between the muscular and mucous coats. These bands seem to have offered obstruction to the advancing growth, which has insinuated itself around or between them, and thus become very irregular.

In order to understand the true arrangement of tissue belonging to the new growth, a specimen must be selected which is growing unimpeded into the cavity of the bowel. Before, however, cutting such a specimen into sections, the free surface immersed in spirit should be carefully examined with direct light by a two-inch power. The surface of some of the tumours thus viewed has a very remarkable appearance, resembling an ant-hill thickly studded with fungi. Upon closer inspection these bodies are seen to be projections from the surface of the tumour. Some are mere asparagus-looking spikes, while others are thin broad leaves arranged like those of an artichoke.

On cutting the tumour into fine sections, the appearance presented beneath the microscope will depend upon whether the section has been made parallel with or at right angles to the growing surface. If cut in the first direction, a beautiful network of circular, oblong, or irregular cavities will be seen. Some are open, lined by a single layer of epithelium ; others are filled by secondary

offshoots. The groundwork between the spaces consists either of a delicate open tissue filled with leucocytes, or of fine bands of fibrous tissue (Plate VIII.).

In viewing such a section it must be remembered that it represents but an isolated slice from a beautiful and complete structure, in order to understand which sections must be made so as to include the free or growing margins.

If such a section be made and examined by the microscope, it shows very clearly the structure of the projections already mentioned as growing on the surface.

The degree to which these projections are developed varies enormously in different tumours. In some they are so highly developed as to cover the whole surface of the tumour with an infinite number of almost tree-like projections, in which central stalks of fibrous or retiform tissue can be seen shooting upwards and sending off lateral offshoots on which the columnar epithelium is arranged in a bipenniform manner (Figs. 1 and 2, Plate V.); while in others, the projections are much more simple, amounting to little more than the raising of the epithelium into undulating ridges (Fig. 2, Plate VI.). Some of these projections, as shown in section, look like villous spikes, but it must be borne in mind that this appearance is produced by the specimens being thin slices, and, therefore, many of these spikes are but broad processes or leaves seen in section (Fig. 1, Plate VI.).

Both surfaces of each leaf consist of a layer of columnar epithelium, between which lies the retiform tissue forming the central portion of the leaf. In some places these leaf-like processes have a tendency to bend over towards each other at their margins; in others, the leaves curl upon themselves, their opposite borders coming into contact. Sometimes, however, each border curls upon itself like a dried-up leaf. In some, at one or more points, along their surface, little ridges appear, which in time become secondary leaves, and after a while behave in a

similar manner to the primary ones. These secondary processes always appear on the concave surface of the parent leaf, so that they often become enclosed by its advancing border. The secondary offshoots, just mentioned, throw off tertiary projections, so that ultimately an exceedingly intricate pattern is produced.

To understand the relation of the epithelium to the fibrous tissue we may regard the growth in the following light. A central stalk of fibrous tissue exists. This gives off secondary branches; these, again, sending off tertiary branches, and so on, till the ultimate fibres expand into a delicate retiform tissue on the surface of which a single layer of columnar epithelium is arranged, and thus the growth resembles a tree or any other complex form of plant life.

By reference to Plate VI., Fig. 1, the explanation of the cavities previously described, whether lying near the surface or far away in the substance of the tumour, and lined with epithelium, is apparent; for it will be at once seen that such epithelium was at a previous stage a portion of the surface of the tumour.

In a previous publication on this subject I stated my belief that these cavities were actually cut off from the surface by the arching over and subsequent coalescing of the cells forming the epithelial margin. As the result of further observation, I do not now believe that such spaces are in reality actually cut off by such coalescing, nor is it necessary that this should be the case to account for these cavities. It is probable that the epithelial lining of such a cavity is still in continuity with that on the surface through intricate and convoluted folds. These cavities in the tumour, far away from the surface, become filled with secondary growths by a means precisely similar to the extension of the growth on the surface.

The method by which the free epithelial border extends should be studied under a high power. The process is as follows:—At one or more points along the border

the epithelial cells increase in length, so that they stand out like a small bud beyond the heads of their neighbours.

If such a bud be closely examined it will be seen that the two central cells forming the group act as the leaders of the growing branch. At the same time it is seen that these lengthened cells are in an active state of generation, and appear as if multiplying by cleavage of their extremities (Plate VII.). As new cells are progressively formed they bend over, and gradually assume a direction at right angles to the line between the primary cells. The line of junction between the walls of the two original cells, which at first was barely visible, becomes more strongly marked, assuming a distinctly fibrous character, and increases in thickness at the expense of the cell contents. After a while, small dark cells appear in the very centre of this line, as if they were again separating the bond of union by which the two contiguous cell walls had united to form the original fibre.

Such cells become vacuolated, and the central line becomes a channel. In time a considerable amount of retiform tissue is formed in the centre of the growing leaf. It would appear as if the fibres of this tissue were formed from what is left behind of the walls of the epithelial cells, that is to say, if the line of junction between any two of the contiguous cells forming the surface of the branch were followed inwards it would be continuous with the fibres of the retiform tissue (Plates II. and X.).

The formation of fibrous tissue has long been a vexed question with physiologists, the prevalent opinion being that it is a formation from connective-tissue corpuscles, and that when found in new growths it is an extension upwards from pre-existing connective tissue. Its formation in health will not be here considered, but in the morbid tissues under consideration I believe that it admits of positive demonstration that it is in great measure derived from the walls of the epithelial cells.

The connection between the fibrous and the cellular elements in any given portion of a morbid growth is not easily traced. The stages of the transformation of the one into the other have passed away, leaving a more or less perfectly formed tissue as a result.

On the margin of a growing tumour, or in the normal tissue, increasing more actively than usual in its immediate neighbourhood, a definite relation can be traced between the cell growth and the fibrous tissue formation; and it is a fair inference to assume that the fibrous tissue of the deeper portions has been produced by a similar process.

The large and clearly defined columnar cells found lining the acini of adenoid growths in the rectum afford singular facilities for tracing the formation of intercellular fibrous tissue.

Almost every writer upon gland structure has assumed the existence of "basement membrane," upon one surface of which are the epithelial cells, and upon the other the retiform tissue, the cells being kept in position by the adhesion of their bases to the membrane. Granting for a moment that a clearly defined line can be seen in some sections lying between the epithelial cells and the subjacent tissue, it does not necessarily follow that such a line is a section of a thin membrane independent of the cells. Such an appearance may be produced by the bases of the cells resting on the same level, and being cut on the same plane. If a section be made of a portion of a bee's honeycomb an analogous line can be seen running down its centre, marking the boundary between the cells of opposite sides, but yet it admits of clear proof that such a line belongs to no independent structure, but is produced by the bases of contiguous cells, each of which participates in its formation.

Now, this fibrous line, supposed to mark the existence of "basement membrane," is frequently absent if the

section be cut exceedingly fine in a direction parallel with the long axis of the cells, and direct continuity can be traced between the fibres of the retiform tissue and the lines between the epithelial cells.

In Plate VII. and in Fig. 2, Plate X., such continuity is seen. It remains, however, to be shown that the fibres are formed from the cell wall rather than by an extension upwards of pre-existing fibrous tissue.

If sections be made in such a way as to cut the growing cells across close to their apices, the lines marking the contact of the cells with one another will show as a fine hexagonal network. This hexagonal network must inevitably be the form taken by soft cylinders in contact with each other (Fig. 20, Plate II.). If a second section be made, nearer the bases of the cells, the hexagonal network will have assumed a circular form, the lines forming it being considerably thicker than those of the first section, the cavities being correspondingly smaller (Figs. 21 and 22, Plate II.).

It is impossible to doubt that the fine lines described in the first section are due to the thickened outline of the protoplasm of the cells, for the same appearance is produced in every cellular effusion.

It can, moreover, be shown by vertical sections (Fig. 4, Plate III.) that the fine network just described, formed by the apices of the epithelial cells, is in direct continuity with the thicker lines seen in the second section, and beyond these with the subjacent fibres of the retiform tissue. If, therefore, it be accepted that the epithelial cell wall and terminal fibre of the retiform tissue be one and the same structure, it would be a fair inference to draw that the deeper part of the same fibres had a similar cellular origin.

In examining various cross-sections of epithelial cells, it will be seen that the original fine hexagonal network does not undergo an equal thickening in all its parts, for it is at the angle of the hexagons that the greatest

thickening takes place, and on this account the circular form of the spaces is gradually assumed.

The hexagonal or circular outlines are often very irregular, as the result of unequal pressure from various quarters. In some sections, such a network has an appearance strongly suggesting the idea of a series of stellate cells, anastomosing by their processes. This delusive appearance is occasioned by the processes of the supposed stellate cell, being, in fact, portions of the circumference of pre-existing cells; the body of the supposed stellate cell being the point of greater thickening, where four or more ordinary secreting cells come into contact (Figs. 24 and 25, Plate II.).

I must confess to some difficulty in understanding the existence of stellate cells. I have never seen one isolated, and it is difficult to conceive that, if the fine lines radiating from such cells be in reality hair-like processes, how it comes to pass that a razor should happen exactly to catch many such processes on a plane so precisely parallel as to show them on section anastomosing across from one to the other. On the other hand, if these supposed processes were membranous walls of other cells, they would always show like fibrous lines in whatever direction the section was cut.

Believing the fibrous tissue to be the permanent refuse, so to speak, of pre-existing cells, the appearance it presents in these morbid growths will be briefly described.

It is first clearly recognised as an open network at the bases of the epithelial cells under the name of retiform tissue.

If the fibres of this tissue be traced downwards from the surface to the deeper parts, it will be observed that the majority of the fibres gradually converge, and coming in contact form bands of fibrous tissue of greater or less thickness. All the fibres, however, do not thus converge, for occasionally, instead of coming in

contact, they form boundaries to well-marked spaces or channels.

Now and again, fibres, forming a bundle, once more spread out in an open network.

Bearing in mind that the examination of this retiform tissue is by thin slices only, it is at once suggested that the appearance presented is not the result of a simple network of fibres, but may be due to a series of convoluted channels, the fine walls of which, on irregular section, give the appearance of a fibrous network. The convolutions of such channels would in great measure account for their not looking like tubes on section. Occasionally, however, a very suggestive appearance is produced in the retiform tissue lying between two adjacent follicles, and instead of a haphazard-looking network, the fibres are arranged in two or three concentric circles, between the lines of which a single layer of lymphoid cells lying in contact with each other can be seen as if contained in a definite canal.

If the retiform tissue is really a series of channels, each channel would appear to commence at the base of a glandular epithelial cell, and such a cell must be regarded as the active living root of the lymph system. If the retiform tissue is really a tubular structure some of the channels become obliterated by their opposite walls coming in contact, as if by stretching, while others dilate into large lymph spaces.

I will now glance briefly at some of the leading characteristics of the cell elements found in these growths. These cells represent extraordinary variations (*see* Figs. 1 to 12, Plate II.).

One of the most prominent features of these morbid cells is their large size. Whereas the normal glandular epithelium is seldom more than  $\frac{1}{1000}$ th of an inch in length, many of the cells in question are at least ten times as long, some of them of such a size, in fact, as to be almost visible to the naked eye.



On the surface some of these cells resemble tubes  $\frac{1}{100}$ th of an inch in length, but not wider than the  $\frac{1}{800}$ th of an inch. The line of contact between the adjacent cells is very clearly marked. In some parts, these tubular cells are filled with a faintly staining, homogeneous, granular material, without the slightest trace of nuclei. They appear, in fact, to be barren cells, like pods without peas. In others, again, all the cells are nucleated. Some contain two or three nuclei arranged equidistant apart between the summit and base of the cell. In these circumstances the cell wall bulges opposite the nuclei, with corresponding hour-glass constriction between the nuclei.

The nuclei in these multi-nucleated cells are so arranged that the bulging portion of one cell fits into the hour-glass constriction of its neighbour, so that every alternate nucleus only is on the same level.

Another form of cell, especially in the growing buds, is where the lower or attached half of the cell is narrowed to the finest tube or line, but its outer half forms an oval bulb, which contains the nucleus. Sometimes the condition is reversed, the outer portion of the cell being reduced to a narrow tube, the nuclei being contained in the bulging portion at its base.

The tubular cells just described are met with in the chronic forms of adenoid tumour. In the more rapid growths the cells are of a more spheroidal shape and more irregular, presenting every grade of variation between a lymphoid and an epithelial type.

On page 59 the development of the leaf-like offshoots by the progressive formation of epithelial cells has been described. If, however, we more closely examine the club-like extremities of these growing buds, it will be seen that the young epithelium is first represented by a little projecting mass of protoplasm closely resembling a leucocyte (Plate VII.), and that the epithelial type of cell is subsequently assumed by this little mass remaining

as a nucleus, and surrounding itself with a material staining more faintly. It thus appears that a young columnar epithelial cell on its first emerging into distinctive life bears a closer resemblance to a simple leucocyte than to its own epithelial parent.

The method has already been described by which the tumour extends on its free surface, and it has been shown that it does so by a progressive development of its epithelial border.

The view is commonly held that the growth advances into the deeper tissues by a similar process, and that it is by a downward prolongation and branching of the follicular crypts that the epithelial growths are formed in the deeper parts.

That this is one method by which the tumour extends into the deeper portions I admit, but that it is the only, or even the commoner, method of extension is doubtful. Until quite recently, I had never been able directly to trace this downward extension, but a specimen has recently come under observation in which something like direct continuity can be traced between the surface follicles of the mucous membrane and those in the body of the tumour. As a rule, however, careful search fails to show any such connection.

Notwithstanding the inability to trace this downward growth from the surface, such continuity might have existed, but yet have remained undiscovered in the sections. It is possible that such a downward dipping might have begun at a single point, and then have spread horizontally like an inverted mushroom. In such a case the connection could not have been demonstrated save in a fortunate section through the connecting pedicle itself. Seeing the destructive process which occurs in the older portions of these growths, such a pedicle would probably have disappeared before the specimen came under observation.

It is certain that these growths must have other

means of development in addition to direct extension by continuity of their epithelial element, otherwise the development of morbid adenoid tissue in isolated patches on the peritoneal coat of the bowel, or in the internal organs, could not be accounted for. It admits of demonstration that these separate points of disease are not directly connected by continuity of epithelial tissue with the primary growth.

Again, when we come to examine under the microscope the line of demarcation between the morbid growth and the tissue which it is invading, we generally fail to find a clear epithelial border marking the boundary. In the more chronic growths a line of fairly formed epithelium may occasionally be seen marking the boundary, but this is not generally the case. For if a section be cut through the new growth, extending into the healthy submucous tissue, it will be seen that there is a kind of no man's land intervening between the growth and the normal tissue. This is infiltrated with a cloud of cells.

The cells forming the extreme border of this infiltration differ in no way from ordinary lymphoid cells, but as they are traced towards the growth they are seen gradually to become larger, and to assume a distinctly epithelial type. These in their turn gradually assume the appearance of an ill-marked adenoid tissue, which in time assumes a more definite type.

In short, the appearances suggest that the growth increases by the gradual conversion of the lymphoid cells on its border into adenoid tissue, and that the source from which these lymphoid cells are derived is the epithelium of the growing tumour, a portion of them gradually developing into the likeness of their parents causing the extension of the growth.

I have already described, on page 16, how the growth invades fatty tissue—viz., by the infiltration of a layer of leucocytes between the fat cells, and by these leucocytes gradually assuming an epithelial appearance.

It may be asked whether the foregoing description applies equally to the rapid-growing malignant disease, which runs its course in a few months, as to the more chronic form, which may be some three or four years in progress before producing a fatal result. A further question also arises as to whether the microscope will afford evidence whereby the slow-growing malignant adenoid tumours can be distinguished from the innocent forms of villous tumour and polypi.

In answer to the first question, I would state that the plan and structure of the growth is similar, but the more rapid and malignant is the growth the less perfect and complete is its structure. If, for instance, under a low power, we examine a section, such as is seen in Plate IX., Fig. 1 (which was a rapidly recurrent tumour that had attained a considerable size in a few weeks), we can there trace the whole outline of an adenoid growth; the various convolutions can be made out, the epithelial, fibrous, and retiform tissues can all be seen in their relative situations, but yet nothing is distinct or clearly defined, and it looks as if the specimen was seen through a thin veil. Upon examining the minute structure under a higher power, the want of definite formation becomes still more apparent, for, instead of the epithelial lining showing well-marked cells, it has rather the appearance of a band of darkly stained protoplasm, indistinctly striated at right angles to its length, and well sprinkled with nuclei (Plate IX., Fig. 2.) If we examine the tissue lying between these vaguely marked epithelial cells, instead of the retiform and fibrous tissue of the more chronic growth, we find embryonic-looking oat-shaped fibrous tissue cells with little or no definitely formed fibrous tissue. An appearance exactly similar to the so-called spindle-cell sarcoma is produced, but the identity of this sarcomatous-looking material with true retiform or fibrous tissue is established, beyond doubt, by following a track of it in the direction of the base of the growth,

where its real nature gradually becomes apparent as it merges into well-marked fibrous tissue.

Not uncommonly in a single growth may various degrees of development of the adenoid tissue be found, from portions so embryonic as scarcely to be recognisable, to others in which well-marked glandular tissue is apparent. Again, a growth which upon its first removal showed well-formed glandular structure, upon its recurrence often shows a tissue of a much more embryonic character.

When embryonic adenoid growth can be recognised under the microscope, it invariably means that the disease will be rapid in its progress.

In answer to the question as to the difference between the slow-growing adenoid cancer and innocent tumours, I have no hesitation in saying, notwithstanding the close resemblance between the two, that they admit of differentiation by the microscope. In innocent growths the arrangement of the branches is far more regular (*see* Plate V.) than in adenoid cancer; while, at the same time, both the fibrous tissue and epithelial cells are more clearly defined.

If a section can be obtained extending through the base of the growth into the rectal tissues, all doubt can be set at rest. In innocent disease the muscular tissues of the bowel are *never* invaded, while in cancer the adenoid structure can be seen spreading into and between the layers of the muscular coats of the bowel. Indeed, I consider the essential difference between the two consists in the fact that the one grows outwards into the lumen of the bowel, while the other extends inwards into the coats of the intestine, or, in other words, that adenoid cancer is a polypus growing upside down (*see* case on p. 96). If, under the microscope, the muscular coats of the bowel can be seen incorporated into the growth, it is certainly malignant (*see* Fig. 4, Plate I., and Plates IV. and VIII.)

## CHAPTER IV

### SYMPTOMS OF RECTAL CANCER

CANCER of the rectum may occur at any age, but like the same disease in other parts of the body, is far more common in middle and advanced life than in young persons. Table B shows the number of cases at different periods of life. It will be seen that in only 10.8 per cent. it occurred in patients under forty years of age, the youngest case in Table A being fourteen, and the oldest eighty-four. As regards sex it is nearly twice as frequent in the male as in the female (*see* Table C).

Few diseases commence in a more insidious manner than malignant disease of the rectum. It is always difficult, and in many instances quite impossible, to obtain exact data as to the duration of the symptoms; nor is this a matter of surprise if the nature of the disease be considered. At one time a patient is absolutely healthy, at a later period as certainly diseased; the gradations between the two are by exceedingly fine degrees.

The earliest symptom of malignant, as of many other diseases of the rectum, is the consciousness of the patient that he possesses such a portion of the body. There is just sufficient uneasiness about the part to excite the imagination from time to time, this uneasiness seldom at first amounting to such distinct pain as to make the patient aware that there is anything actually wrong; sometimes there is merely a sensation of itching about the anus. As the disease advances symptoms

of a more definite character make their appearance; these symptoms are very varied. Speaking generally, and in typical cases, the discomfort gradually increases to a dull, heavy pain, especially noticed after exercise and at night. The fæces become streaked with blood, or covered with a white slimy matter. As time goes on, the symptoms of stricture appear, and calls to the closet become frequent. The motions come away in fragments, or, if cohesive, are small in diameter. At this period constipation may alternate with diarrhœa. The anus becomes excoriated, although not always so, and the linen is stained with a dark, offensive discharge. The patient has a constant feeling of the bowels being full and requiring evacuation. At times there is considerable tenesmus, the frequent calls to stool resulting in a blood-stained purulent discharge. The patient begins now rapidly to emaciate, the pain becomes more constant and severe, and he is much troubled with wind. Secondary symptoms begin to develop, the digestion is impaired, the legs swell, the liver, perhaps, becomes large and nodular from secondary affection. The patient gets worse, and gradually dies of exhaustion, worn out by pain and bleeding, or the fatal termination may be more abrupt by an attack of acute peritonitis, or of complete intestinal obstruction. From the commencement of the symptoms to a fatal termination, the time depends partly on the nature of the cancer, and partly on the age of the patient. In the Table of Cases, page 186, it will be seen that patients have generally had some symptom from six to twelve months before consulting me, and that the average of life in unoperated upon cases after my examination was about eight months. These facts point to about two years as the time in an average case for the disease to end fatally if left to run its course.

When soft and fungating, its course is more rapid than when spreading as a superficial ulcerating layer,

while the younger the patient the more quickly does the disease run its course. Thus, the most rapidly fatal case of which I have notes was that of a lad, aged seventeen, seen in consultation with Dr. Forbes, of Rock Ferry. The progress of the disease was so rapid in this case, that the period from the onset of the symptoms to the date of death was only eight months. As a rule, however, the disease destroys life between the second and third year after the onset of the symptoms, though occasionally life is extended to a longer period.

A gentleman consulted me in 1886 who two years previously, whilst staying at Leeds, had an attack of complete obstruction, and lumbar colotomy was performed by Mr. Pridgin Teale. A few weeks afterwards the motions again commenced to pass the right way, and the colotomy opening was allowed to close, and he remained in what he described as good health and little discomfort till about six months before seeing me. Since that time he has had an intermittent dull aching pain in the lumbar and sacral regions. He has also had a considerable amount of mucoid discharge occasionally stained with blood. On examination I found nothing left of the colotomy wound with the exception of a sinus which would just admit a slender probe.

On rectal examination a cancerous mass could be felt high up the bowel. After consultation with Mr. Teale I performed colotomy, and the patient lived in comfort for another two years, the date of his death being four and a half years after the first symptoms of obstruction.

To illustrate the general symptoms of rectal cancer I have selected the three following cases from my note-book.

The first illustrates a somewhat rare form, for the amount of disease in the bowel itself was very small, compared to that in the surrounding tissues; the second and third cases represent very common forms of the disease.



For the following notes I am indebted to Mr. Gillam:—A. H., admitted into the Great Northern Hospital early in 1877. No family history of phthisis or tumours. He had been a healthy man up to two years ago. At that time he first noticed an uneasy sensation about the rectum. This sensation scarcely amounted to pain, except occasionally on the passage of a constipated motion. After these sensations had existed some months, the patient noticed for the first time a little blood in the fæces. His linen, also, was occasionally blood-stained. At this time he consulted a doctor, and was treated for piles, but the symptoms remained nearly the same during the next twelve months. He then thinks that he caught cold; anyhow, the symptoms became, on a sudden, considerably aggravated. He suffered so much pain as to be kept awake at night, and had a good deal of diarrhœa. About a week after this attack he had a good deal of offensive blood-stained mucous discharge, but with this discharge the pain became less. The discharge has continued ever since, but only in moderate quantity. For the last six months he has had considerable trouble with his motions, and has taken much purgative medicine. The motions have been getting smaller, being scarcely thicker than the little finger, and always passed with difficulty. On admission into the hospital he was weak and much emaciated, with a sallow, jaundiced appearance. He complained much of a burning pain in the region of the coccyx; this was always worse at night, depriving him of sleep. There was only a small amount of discharge from the anus. For two or three consecutive days he would complain little of pain during the day. At other times he would suffer more, and be much tormented with a constant desire to stool. The pain was not aggravated on passing a motion, after which, indeed, he often obtained relief.

Upon examination a considerable amount of œdema existed over the sacral region, and pressure on this spot

caused pain. The liver was not noticed to be enlarged, nor did it feel nodular, but three months later it could be distinctly felt to be both enlarged and nodular. There were two very small, slightly œdematous folds of skin about the anus, otherwise it appeared healthy. On passing the finger into the bowel it felt healthy for about an inch and a half, then became harder than natural, and a distinct lump could be felt projecting under the mucous membrane of the posterior wall. It appeared at first as if at about three and a half inches from the anus the bowel ended in a cul-de-sac, but upon a little manipulation the tip of the finger could just enter a tight annular stricture, which appeared to extend upward some distance. The bowel was evidently firmly adherent to the surrounding tissues; the tip of the finger in the stricture was unable to move it. The patient lingered at the hospital for some months, gradually growing weaker. He was one night seized with sudden severe abdominal pain, which in a few hours terminated in fatal collapse.

The post-mortem was performed forty-eight hours after death. The body was thin and emaciated, the blood in the vessels was not coagulated, the belly was much enlarged and tympanitic. Upon opening the abdominal cavity a large quantity of purulent fluid escaped; the whole of the right and left hypochondriac regions were occupied by the liver, which presented a mottled appearance, being thickly studded over the surface with hard white masses about the size of three-penny pieces. Upon the liver being removed and cut into, nodules were seen pretty equally distributed over the left side, each nodule being about the size of a pea or bean. On the opposite or right side were three large white patches instead of the smaller deposits found on the left, the largest patch being two and a half inches in diameter. These had at their margins a stellate appearance, due to white bands radiating a short distance into the healthy structure; the centre of these masses was

of a soft consistency, the interior of the larger patch being like thick cream. The liver weighed seven and a half pounds, it was in no place adherent to the parietal layer of the peritoneum, and it appeared as if this membrane had resisted the advance of the disease. The gall-bladder was distended with bile, the spleen and kidneys were free from disease, but the pancreas was affected with nodules much in the same manner as the liver. The whole chain of lumbar glands was infected, many of them being the size of a hen's egg. The intestines were apparently free from disease, except at a spot situated four inches from the anus; at this point the intestine became quite suddenly constricted. This constriction felt like a tight ring outside the mucous membrane; this was the stricture felt during life.

The bowel was greatly distended above the strictured portion and full of soft fæces, but no ulceration could be detected in it. A further examination of the seat of stricture showed that the constriction was caused by a deposit of cancerous material, one-eighth of an inch thick, and a quarter of an inch broad, just at the line of the recto-vesicular fold of the peritoneum. This band extended half round the bowel. A tight portion of fibrous tissue occupied the remaining half of the bowel circumference, and was continuous at each end with the line of cancer. Indeed, it appeared as if some of the fibres of the fibrous tissue that here encircle the bowel, were continued into the cancer line, and that the contraction of the cancerous portion had caused the tightening of the fibrous band.

The deposit of cancer was beneath the mucous coat of the bowel, involving the submucous and muscular coats. Upon putting the finger into the cul-de-sac between the rectum and bladder from the opened abdomen, the peritoneum passed over the deposit just described with quite a smooth surface. Behind the rectum, between it and the sacrum, but not adherent to the wall of the

bowel, was a mass of cancer as large as an orange, softened in the centre to almost creamy consistency. This mass had caused the absorption of a considerable portion of the coccyx and lower part of the sacrum. It appeared as if this mass sprang from one of the lower coccygeal glands.

J. W., aged forty-two, a well-developed, tall woman, with a good family history. She had the appearance in the face of some suffering, but was not much emaciated. Eighteen months ago she noticed pain in the back about the lumbar region. She had no other symptom until a year ago, when she first noticed a slight discharge of blood, but she suffered no pain or uneasiness. Seven months ago she first had local pain, but this only during and after defecation. After a few weeks the pain became continuous, especially bad at nights, compelling her to walk about the room for hours. Three months ago a fetid, sanguineous, purulent discharge came on. After the onset of this discharge the pain became a great deal less. She has lost blood for six months from the rectum; slight at first, more of late, but never profuse. Has had little diarrhoea. The purulent discharge, which soon after its first onset was very diffuse, has been much less of late.

Upon examination, a growth of firm consistency, the size of a large nut, was seen springing from the mucous membrane just within the anus. Upon introducing the finger within the bowel, the rectal wall, especially the anterior portion, felt hard and irregular, with some ulceration in places, and was more like a semi-rigid tube than a contractile canal. As far as the finger could reach, the bowel was thickly sprinkled over with hard nodules, from a sixth to a quarter of an inch in diameter.

The rectum, notwithstanding its nodular, rigid condition, was fairly movable upon the surrounding parts. On a further careful examination under chloroform, it was found impossible to ascertain the limits of the disease;

no operation was thought advisable. She continued to attend as an out-patient for the next two months, obtaining great relief by using, night and morning, warm injections of starch and opium (thin fluid starch 3j, liq. opii sed. ʒxx.) The patient became gradually weaker, and died four months after she was first examined at the hospital.

A medical practitioner at Manchester, aged fifty-six, consulted me for the following symptoms. His attention was first called to the bowel by a sudden attack of diarrhoea seven months previously. The diarrhoea passed off in a few days. For nearly a year before this attack he had felt from time to time a slight sensation of the bowel not being completely empty, but he never had the slightest pain or inconvenience, and never passed any blood. Since the attack of diarrhoea, however, he has on three or four occasions noticed the fæces stained with blood. He has also noticed that when the fæces are soft they are distinctly grooved on one side. He has some discomfort about the bowel, but nothing like pain. He feels well and strong, and is able to play golf, but, somewhat to his surprise, he finds that he has lost a stone in weight during the last three months. Upon examination, I found the anus quite healthy with a normal sphincter, and there was no excoriation and no discharge. The first inch and a half of the bowel was also natural, but the finger then came into contact with a series of hard, nodular projections, most marked over the prostate, but extending all round the bowel. On further examination these projections proved to be the margins of a considerable mass of malignant deposit.

This patient persevered for some time with the Chian turpentine, then a fashionable treatment, but without the least benefit, and died twenty-two months after my examination.

Perhaps it will be well to consider in a little more detail the various symptoms mentioned.

**Pain** is of such common occurrence in all rectal disorders that it only becomes a valuable adjunct to the diagnosis when in conjunction with more definite symptoms. It is seldom an early symptom, being commonly the result of the morbid changes in an advanced stage of the disease, for at first discomfort merely is experienced, especially after walking or sitting long in a constrained position. There is often an uncomfortable feeling of wanting to stool, yet upon trial nothing but a little mucus is passed. As the disease advances the pain increases. So far as my experience goes the amount of pain greatly depends upon the situation of the disease. When situated at the anal margin or opposite the prostate the suffering is much greater than when situated higher up the bowel, in which situation the tissues have more room to expand. Sometimes when situated high up the bowel scarcely any pain is felt until quite late in the disease. Indeed, I have seen cases where from first to last, that is, till the time of complete obstruction, the patient never had the slightest pain of any kind. The sharp burning pain complained of during and after the passage of a motion is due to the irritation of the tender ulcerated surface. Not infrequently a dull, aching pain, more or less constant, is referred to the lumbar or sacral region. This pain is often rather relieved than aggravated by the passage of fæces. It is due to the direct pressure by the disease on the nerves lying between it and the sacrum, or to the accumulation of fæces above the narrow part. As already noticed, the onset of pain is generally gradual, but it not infrequently happens that a somewhat sudden aggravation of the pain occurs, followed in a few days by a copious muco-purulent discharge which somewhat relieves the patient. There can be no doubt that this acceleration is due to accidental inflammation of the parts in the neighbourhood of the disease, and is often accompanied by a rise in the temperature and the formation of an abscess. On the whole I am inclined to believe

that the accounts given of the pain suffered in rectal cancer are much exaggerated, and that it is less severe than is often suffered in fissure or inflamed piles. I have more than once found considerable masses of cancer in patients who were quite unaware of the disease owing to their having suffered scarcely any discomfort. If there is any tendency to inflammation about the growth the pain undoubtedly becomes severe. Under these circumstances the patient can scarcely bear examination. Some patients, again, seem to have a natural anæsthetic condition of their whole nervous system, while others are morbidly sensitive. Indeed, it is a fact constantly observed by all surgeons that no two patients appear to suffer in the same degree from similar diseases or injury.

**Bleeding** from the bowel is almost sure to take place at some period of the disease ; it appears to depend upon two causes. In the early stage, the blood comes from the congested mucous membrane lying over the disease, and is much increased by constipation, which retards the free return of venous blood. At a later period it may not only be due to this cause, but to actual ulceration of one of the hæmorrhoidal vessels. Cases are recorded in which the bleeding has been so alarmingly persistent as in itself to cause the death of the patient. Bleeding from the bowel, when copious and persistent, and when not dependent upon hæmorrhoids, should always be looked upon with some suspicion.

In the following two cases severe bleeding seemed to be the only symptom at an early stage.

Mr. W., aged thirty-five, a patient of Dr. Morison's, and seen in consultation with Sir Thomas Smith, had for two years passed blood in large quantities from time to time. Has always felt strong and well, taking part in ordinary exercise, shooting, fishing, &c., up to the present time. For the last six months he has had some irritation of the bowel, requiring to go to the closet two or three

times a morning. A year ago he was carefully examined for the hæmorrhage, but beyond some piles, nothing wrong could be detected. On examination I found a large mass of cancer commencing two inches from the anus, and extending upwards for three inches, but it only occupied about half the circumference of the bowel, and had produced no stricture.

Mr. M., aged sixty, a patient of Dr. Connor's, of Wandsworth, had for fourteen months some slight irritation of the bowel, which he thought of no consequence. A year ago he had a very severe hæmorrhage, coming on quite suddenly. Since that time the irritability of the bowel has increased, but with only very slight bleeding occasionally. A few days ago he had a second most severe bleeding, losing some pints of blood. I was asked to see him on account of this bleeding. On examination a ring of adenoid cancer was found commencing just within the anus, and extending upwards only two inches. The growth was excised, but a rapid recurrence took place.

There are, however, many other conditions besides malignant disease which may give rise to the bleeding. As an instance, it may not be out of place to mention an interesting case, for the details of which I am indebted to my friend Mr. Edwards, of St. Mark's Hospital.

A patient was admitted into St. Mark's on account of hæmorrhage from the rectum. She had been very unwell, with vague pains about the abdomen, for some months. During the last few days she has had violent bleeding from the bowel. Soon after admission she had another violent attack of bleeding, from which she never rallied, and died in a few hours. A post-mortem examination showed a small deep ulcer of the stomach, which had opened into the gastric artery. She had vomited no blood, nor could any other lesion be found in the alimentary canal.

A somewhat similar case of profuse hæmorrhage from the bowel, the result of gastric ulceration, is mentioned



in the catalogue of the Middlesex Hospital (Series 8, No. 33), but in this case there was also hæmatemesis.

**Discharge** of a muco-purulent nature is seldom absent if the disease has existed any length of time. At first this is simple mucus, but becomes purulent after ulceration has taken place, while at a further stage of the disease it may become dark, forming the "coffee-ground discharge" so often described. From time to time this discharge is considerably augmented in quantity, while at the same time it is more purulent in its nature. A day or two prior to this increase the patient will complain of intense pain, which is greatly relieved by the discharge. The explanation of this has been already mentioned. The discharge has a highly offensive odour, the peculiar odour being considered by some surgeons pathognomonic of the disease. Personally, I must confess to be unable to verify these assertions beyond the fact that all discharges from this neighbourhood are very offensive.

The examination of this discharge under the microscope may be a considerable aid to the diagnosis in those cases in which the disease is beyond reach of the finger. The bulk of the solid particles found in the discharge consists of lymph or pus-cells with fæcal débris, but not infrequently little masses of the growth may be detected here and there, especially if it be of a soft, friable nature. Such little portions can of course only be observed in a comparatively advanced stage of the disease after ulceration of the mucous membrane. I attended, with Dr. Norman Moore, a case in which there were obvious symptoms of stricture, beyond the reach of the finger, so that there was considerable doubt as to its nature, until one day a fragment, the size of a hazel-nut, was discovered in the discharge, which, on examination under the microscope, proved a beautiful specimen of adenoid cancer.

**Diarrhœa** is an intermittent symptom during the

course of the disease. The sufferer often has a sensation as if he required to go to stool, especially in the morning, and, after a little straining, passes a small quantity of fæces, as well as some muco-purulent material. He does not feel, however, as if the bowel had been emptied, and may have recourse to the closet many times. On these occasions the discharge is more of a muco-purulent material than any true fæcal evacuation. The desire for a motion in some patients quickly follows taking anything to eat or drink, especially if very hot or cold. When the large intestine is in an irritable condition, the taking of food appears at once to start peristaltic action in the colon, causing the expulsion of any fluid it may contain.

In some cases the patient is much troubled with "wind," which he fears to pass unless at the closet, in case at the same time some discharge should come away.

In using the word diarrhœa, the surgeon must be careful not to be misled by regarding it in all cases as resulting from simple looseness of the bowels. Indeed, when there is any stricture present, the so-called diarrhœa is often but a symptom of extensive fæcal collection behind the stricture. What the patient passes in these cases is a purulent mucoid discharge, stained by small particles of fæces washed from the surface of the collected mass.

Many of these patients fancy they are suffering from "chronic dysentery," and have undergone prolonged treatment for the supposed disorder without benefit.

This spurious diarrhœa is often one of the most marked features of the disease, and when the cancerous stricture is too high to admit of being felt by the finger, is perhaps the most important and reliable of all the symptoms.

I give below an exact copy of some notes sent to me by a patient six months before his death from malignant disease of the upper part of the rectum. The record

shows how the diarrhœa may vary from day to day, and how at times well-formed motions may be passed.

June 9, 8 A.M.—Blood and mucus.

„ 9 A.M.—Blood with little solid motions.

„ 10.50 A.M.—Blood with little solid motions.

„ 11 A.M. to 3.30 P.M.—Three very small, well-formed motions.

„ 4.45 P.M.—Blood and mucus.

„ 5.30 P.M.—Blood and mucus.

„ 6.40 P.M.—Blood and mucus.

„ 10 P.M.—Blood and mucus.

„ 10.45 P.M.—Blood and mucus.

Up five times in night, blood and mucus, some dull aching pain in the back most of the day.

June 10, 9 A.M.—One small thin action.

Nothing else all day. Only up once in night, passing a little blood and mucus, quite free from pain.

June 11, 8 A.M.—Blood and mucus.

„ 9 A.M.—Blood and mucus.

„ 12.30 A.M.—A large full-sized motion quite free from blood.

„ 5 P.M.—Blood and mucus.

„ 6 P.M.—Blood and mucus.

„ 9.30 P.M.—Blood and mucus.

„ 10 P.M.—Blood and mucus.

Up four times in night. When blood and mucus is passed, it comes quite suddenly.

**Constipation** is a symptom of importance as a means of diagnosis, if the disease is too high for digital detection. It is generally an earlier sign than diarrhœa, but not unfrequently intermits with it. It may exist to almost any extent, from a slight trouble at the commencement of the disease to a grave complication as it advances. Complete intestinal obstruction, a frequent complication of intestinal cancer, sometimes results from the blocking up of the intestinal canal by the gradual encroachment of the growth into its calibre. It is not rare, however, to find that the earliest symptom causing a suspicion of cancer of the large intestine is the sudden onset of complete obstruction (*see* page 88).

The various symptoms just enumerated in detail are of the highest importance in calling attention to

the probable existence of cancer, and have to be relied upon if the disease is in the sigmoid flexure or upper part of the rectum; but in the lower portion of the bowel the diagnosis can be made sure by digital examination.

**Digital Examination.**—In order to make this satisfactory it is essential to have the bowel empty. With this object the rectum should be thoroughly washed out with a warm water enema. The best position for an examination is to have the patient lying on his side with the knees drawn up. From four to five inches of the rectum can be examined by the finger, and if the patient be directed to strain and bear down a further length of bowel is brought within reach. If, at an ordinary examination, nothing can be felt, but yet the symptoms are suspicious, a second examination under an anæsthetic should be advised, and its value, if properly conducted, is inestimable. I have often been asked whether such an examination could not be made on my consulting room sofa with “a sniff” of chloroform. Such half measures are dangerous and useless. To make such an examination satisfactorily the patient should be properly prepared, the anæsthetic being given on a proper table. He will require to be thoroughly under the anæsthetic, and the examination made in the lithotomy position. I have many times made an accurate diagnosis, and been able to actually feel the growth in patients on whom previously an examination without an anæsthetic had revealed nothing.

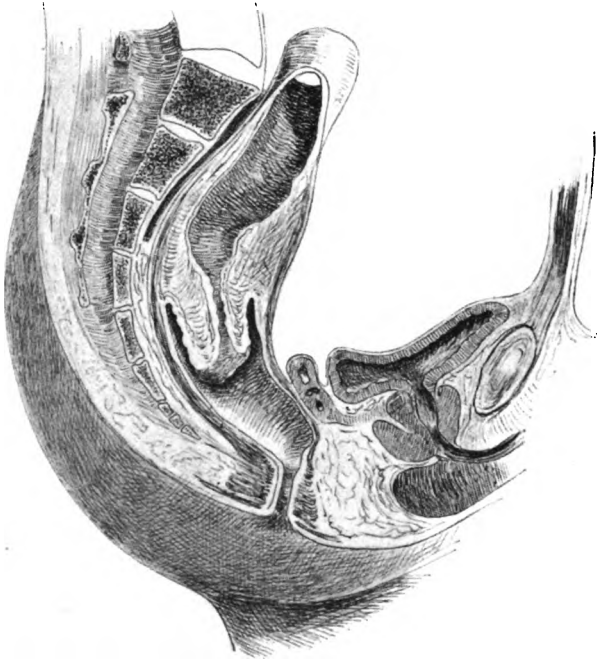
The margin of the anus should be carefully scrutinised for any portion of growth that may be in sight. It sometimes happens that a fungating projection from the anus at once declares the nature of the disease. More frequently, however, the anus is normal, or merely slightly oedematous and red from the irritation of the discharge. Upon introducing the finger, the condition of the part will depend upon the length of time the disease has

existed, the portion of the bowel implicated, and the physical character of the growth.

Commonly a certain interval of healthy bowel exists between the anal margin and the lower border of the disease. Perhaps the commonest point at which the disease is situated is at a distance of two and a half inches to four inches from the anus. After this the disease is more frequently found just below the sigmoid flexure. The amount of bowel diseased varies from the smallest patch to the whole calibre for several inches, the extent being in almost direct proportion to the duration of the growth. If the examination be made at an early period, an indurated portion of the bowel may be felt. This induration does not feel like a distinct tumour, but more like a thickening and hardening of the submucous tissue. The mucous membrane is generally pretty firmly adherent to the subjacent mass. The membrane is not ulcerated, but may feel somewhat irregular on its surface, being slightly raised in places while it is depressed in others. As a whole, however, the mucous membrane, pushed up by the growth, projects more or less into the bowel cavity. As explained in the chapter on Pathology, the disease appears to spread or extend after two different methods, the most frequent being its extension as a thin, firm layer between the muscular and mucous coats. By the time this laminar form of disease comes under clinical observation, more or less extensive ulceration has occurred, and the finger can distinctly feel the firm base of an ulcer with abrupt, hard, raised overhanging margins, beyond which the disease apparently terminates somewhat abruptly in the healthy tissue. If the disease has extended so as to form a distinct tumour in the submucous tissue, the lump or lumps can be clearly felt projecting into the bowel cavity, or, again, a tight annular stricture, around which a hard deposit exists, indicates the disease. Sometimes, though more rarely, the rectum seems studded with hard, small nodules. If the disease



**FIG. 4A.**



**Sagittal section of pelvis showing a malignant growth invaginating the rectum. The constricted lumen in the middle of the growth and the cul-de-sac surrounding the growth are well seen.**

*To face page 85.*





**Fig. 4.**



**A diagrammatic illustration of the way in which the bowel at the site of the disease becomes invaginated.**

*To face page 85.*

be advanced, soft fungoid masses, blocking up the canal, may be felt; such masses bleed with the slightest irritation. When an annular stricture exists it is commonly just below the reflexion of the peritoneum.

I may here refer to a curious condition often present. On a hasty examination it may appear as if the disease were confined to the anterior or posterior wall only, while in reality it surrounds the bowel. The mistake arises from the tendency for that portion of the bowel in which the disease is situated to become invaginated from constant straining, so that there is a deep cul-de-sac of healthy bowel all round the growth. The finger passed into this cul-de-sac feels the growth lying in front or behind, as the case may be. Of course, with a little further examination the condition of things may be ascertained, and the orifice of the intussuscepted bowel with the disease surrounding it can be felt not unlike an os uteri projecting downwards into the bowel cavity (*see Figs. 4 and 4a*).

This annular stricture is so common in malignant rectal disease that its structure requires special consideration. Sometimes it is due to a deposit of new growth in the submucous tissue around the entire circumference of the bowel. In such a case the mucous membrane may have given way, and the growth protrude into the bowel all round. This, however, is not the common cause of the stricture, which appears to be generally due to a deposit of cancer at one spot of the bowel, commencing in the submucous tissue, and extending into the muscular coat, and as it does so incorporating into its substance the fibrous trabeculæ of the muscular coat. These fibrous trabeculæ naturally extend round the whole circumference of the bowel, so that, when they are drawn upon at one spot by the action of the growth, it has much the same effect upon the bowel as if it had been surrounded by a piece of string, the knot of which is being continually drawn tighter.

If a stricture exist the greatest caution should be exercised in passing the finger through. It is surprising the ease with which such strictures will suddenly tear and the rent extend into the peritoneal cavity. All temptation to forcibly thrust the finger into the stricture should be resisted as a proceeding fraught with danger. And the greatest possible gentleness must be used at the examination.

The following case will show the extreme ease with which a rent may be made, even by a comparatively gentle digital examination :—

A patient was admitted into St. Bartholomew's Hospital with stricture of the rectum at two and a half inches from the orifice. She was placed under chloroform, and examined in the lithotomy position for the purpose of diagnosis. On the finger of the surgeon being introduced, the tip just entered the stricture, which, on gentle pressure, yielded slightly. On passing the finger a little further still, without using any force, the stricture suddenly split, the finger apparently passing into the peritoneal cavity. Further examination was at once desisted from, and the patient put back to bed and ordered opium. Within a couple of hours the patient was suffering intense abdominal pain, and by that night the belly was distended and the knees drawn up. The following day the face was pinched and hollow, the pulse hard and rapid, and after a day of intense suffering she became collapsed, and died within thirty-six hours of the examination. At the post-mortem, a stricture on the level of the peritoneum was found, the upper wall of which, from ulceration, was little thicker than blotting-paper. In the centre of the thin portion was a ragged rent, extending into the peritoneal cavity, which contained a considerable quantity of liquid fæces.

Such a case is sad beyond expression, for the mere attempt to ascertain what might be beneficial to the poor creature was followed by a sudden and violent death.

I was present at the examination in question, observed the patient carefully afterwards, and performed the post-mortem. I need not say that this accident strongly impressed me with the extreme care required in examining a patient with rectal stricture.

I also know of another case which occurred recently. A bougie had been passed twice for a gentleman without a mishap. On the third occasion a larger size was employed, and some difficulty experienced in passing it through. Immediately afterwards the patient complained of great pain at the site of the stricture, which quickly extended to the whole of the abdomen, and he died on the third day with all the symptoms of acute general peritonitis. There can be no doubt that, in this case, the stricture had given way into the peritoneal cavity. (*Cf.* also "Diseases of the Rectum," p. 213, for similar cases).

**Diagnosis when beyond reach of the finger.**—The symptoms already described as occurring when the stricture is in the lower part of the rectum, are in some measure present when the disease is situated higher up, but until complete obstruction occurs they are generally less severe and clearly marked.

The constant desire to defecate is not so prominent, neither is the same amount of pain and discomfort noticeable. This is what might be expected when the different functions and nerve-supply of the upper and lower part of the rectum are considered. The lower part is more sensitive, and even in health intolerant of the pressure of fæces which at once evoke the desire to defecate, while the descending colon and upper part of the rectum are comparatively tolerant of fæcal collections.

In cases of high obstruction the symptoms may consist of obstinate constipation, alternating with diarrhoea, while colicky, griping pains are of frequent occurrence. Occasionally even these symptoms may be absent, or not sufficiently marked to cause the patient to seek

advice, the first indication of the danger being the sudden onset of complete obstruction.

The cause of this sudden onset is a matter of considerable interest, for it seems difficult to understand how such could occur without previous symptoms, or with symptoms so slight as scarcely to have attracted the patient's notice. The following cases throw light on this point, and explain the occurrence, showing that it is the result of the sudden accidental blocking of a previously narrowed though pervious gut.

C. B.,\* without having had previously any marked symptoms, was suddenly seized with obstruction of the large intestine. Colotomy was performed by one of my colleagues, but the patient died on the fifth day. The following were my notes of the post-mortem. The whole of the peritoneum showed signs of recent acute peritonitis, being everywhere matted together with large masses of yellow lymph. There was a small amount of fæcal extravasation in the neighbourhood of the colotomy wound, but owing to the state of the parts its source could not be easily ascertained. On tracing the descending colon downwards, it was much dilated. At a distance of five inches from the anus was an annular stricture not more than three-fourths of an inch in length, which would only admit a No. 12 catheter. The opening was completely blocked by a small oval piece of fæces of extreme hardness. In the Hospital Museum† (specimen 2017) is a very similar case, interesting not only as regards the cause of complete obstruction, but for the remarkable length of time the patient lived after the obstruction became complete.

“The patient was a lady, thirty years old. She had been for three years subject to occasional attacks of obstinate constipation which were generally followed

\* Henry Ward Register, St. Bartholomew's Hospital, vol. viii. p. 175. (Notes by Author.)

† St. Bartholomew's Hospital.

by diarrhœa. Four months before her death the obstruction of the intestine became complete, and after this time she had no fæcal evacuation. Death was eventually caused by the bursting of the intestine, which was enormously distended. The cause of the obstruction was found to be a cherry-stone, which had lodged above a stricture in the descending colon, and had completely closed the canal."\*

In Guy's Hospital Museum (Specimen No. 1887<sup>75</sup>) is a specimen of adenoid cancer causing intussusception. In this case a patch of adenoid disease affected a portion of the bowel, somewhat narrowing its calibre. The pressure of fæces above this had caused its invagination into the bowel immediately below, producing complete obstruction. Many such specimens have been shown at the Pathological Society, and such a condition readily explains the sudden onset of obstruction without previous warning.

A very slight amount of such intussusception is sufficient to cause obstruction.

A woman of middle age died at St. Bartholomew's after colotomy performed for sudden intestinal obstruction. At the post-mortem was found a narrow ring of growth projected into the canal for about a quarter of an inch all round the circumference of the bowel. It looked like a diaphragm, the hole through its centre just admitting the little finger. The portion of bowel immediately below this diaphragm was considerably contracted, so that when the growth was pressed upon from above it passed a short distance into the narrow portion below, the opening through its centre being completely obliterated.

Another, although perhaps rarer, condition is sometimes found, which will also account for sudden obstruction. In such a case a considerable dilatation forms above a slight annular stricture; after a time a pouch from this dilatation extends downwards below the level

\* St. Bartholomew's Hospital Museum Catalogue.

of the strictured portion of the gut. The collection of a hard lump of fæces in this pouch pressing upon a point below the stricture occludes the bowel, the margin of the strictured bowel being closed in a valve-like manner.

Breschet publishes a case, in which he describes such a condition causing obstruction in the body of Talma. In this case Nature had made a marvellous effort to remedy the defect. The dilated bowel above the contraction was put into connection with the part of the rectum situated below the contraction, a new canal having established itself between the two by the absorption of the adjoining walls, adhesions having formed between them.

If subjective symptoms be present, the bougie may be of value in confirming the diagnosis, although I believe from its use alone it would be rash to assume the existence of a stricture. The bougie best adapted for an examination is No. 6, which should be made hollow with a small pipe at its base, so that water may be injected through it at the time of examination. In passing a bougie it is very common to find an obstruction at five or six inches from the orifice. This is either due to the bend of the sacrum, or to the bougie catching in one of the loose folds, but by a little very gentle manipulation the obstruction may be overcome. If caused by a fold of the mucous membrane, by injecting water through the hollow bougie the bowel will be distended and the fold obliterated. I have by these means on one or two occasions passed the bougie far up the bowel, when, prior to the injection of the water, it would only enter a few inches.

In the passage of the long bougie no force should on any account be used, for the bowel can be perforated with the greatest ease. In a case\* at St. Bartholomew's Hospital, in which an injection was given by the long tube prior to an operation on the perinæum, the patient

\* St. Bart.'s Hosp. Reps., Appendix, p. 88, 1883.

immediately after the injection became collapsed, and died of acute peritonitis, and it was found that the bowel had been perforated by the enema tube, and the whole of the soap and water thrown into the peritoneal cavity. Many similar cases have been recorded.

The question is sometimes raised as to whether in obscure cases of obstruction the whole hand might not be introduced within the bowel with a view to thorough examination. In eight consecutive cases, in the post-mortem room, I endeavoured to practise this manoeuvre. In two I failed to get within the anus. In two of the remaining the rectum was extensively lacerated; in one the rent extended into the peritoneal cavity. In the remaining cases I was enabled by perseverance to get my hand as far as the sigmoid flexure, but the fingers were so tightly grasped that I doubt very much whether I could have made a diagnosis in the living body. My own hand is moderately small for a man (seven and a half), but from my experience on the dead body I feel that it would be an extremely hazardous proceeding to attempt to pass my hand into the living body. If cases pointed strongly to a stricture of the upper part of the rectum or sigmoid flexure, I should not hesitate to confirm the diagnosis by a small abdominal incision made in the inguinal region, so that if the diagnosis was confirmed, the operation of inguinal colotomy or excision could be at once proceeded with, as in the case I have referred to in my practice, on page 236, "Diseases of the Rectum."

**Colloid Cancer** in its physical characteristics differs in some respects from the foregoing description, owing to its soft semi-fluid consistency. This disease is stated by some authorities to be the commonest form of malignant rectal disease. This is entirely opposed to my experience, for I believe that this disease is rarely met with; nor do our pathological museums lead one to suppose that it was more common formerly than at the present time. A specimen in the Middlesex Museum, Series 8, No. 131,



and another in the College of Surgeons, are described as examples of this disease. It appears in both these cases as if a fine transparent membrane had been spread over the mucous lining of the bowel, and this membrane had then been raised into a number of small vesicles containing the colloid material. Some of these excrescences are so minute as to be scarcely cognisable to the naked eye ; others, again, are as big as large peas ; the whole, in fact, strongly impresses one with the idea that a certain number of Lieberkühn's follicles had become obstructed by a thin membrane dilated into bladder-like excrescences by the mucoid secretion.

Cruveilhier\* gives the following excellent description of a case of colloid cancer. It seems to be little more than an exaggeration of the condition just described :

"A case of colloid cancer of the lower part of the rectum of an old woman. The gelatinous matter is contained in cysts of various sizes, pressed firmly one against the other, so that an appropriate name would be encysted gelatiniform cancer. The anus was surrounded by a number of different-sized swellings, several of the larger of which were surmounted by smaller swellings, in such a way that the anal opening occupied the bottom of an extremely deep cul-de-sac. Two ulcerations could be seen at the entrance of the anus. The rectum, at a little distance from the orifice, presented a zone-like ulceration ; it was deep, and had destroyed all the thickness of the rectum in one part of its circumference and communicated with furrows, which penetrated to the diseased skin which was contiguous to the anus. The disease, which had given the rectum an enormous thickness, stopped suddenly about three inches from the anus. Immediately above the muscular coat was greatly thickened. This disease presented an appearance which I have never seen before. Imagine a multitude of acephalo-cysts of unequal size, of which some resembled

\* Cruveilhier, "*Traité d'Anatomie Path. Gén.*," tom. v.

pigeons' eggs, tightly pressed one against the other in a fibrous woof, and one would have a sufficiently exact idea of the disease. But these were not acephalo-cysts. The envelope of each cyst was fibrous, very dense, and very thin, and contained matter resembling apple jelly. On the surface was a cretaceous matter containing calcareous grains. In the centre of the gelatiniform matter were seen blood-vessels, resembling those formed in an egg, vessels without linings, terminating in a swelling of one of their extremities. The fibrous network, in the middle of which these cysts were situated, was evidently composed of the membranes of the rectum. I there recognised the longitudinal coat of the intestine. The external covering of the rectum had not the slightest vestiges of cysts, but was alveolar tissue of fibrous meshes, filled, like a sponge, with gelatinous matter, which was squeezed out with difficulty. This degeneration extended to the skin. An extremely thin pellicle, almost epidermic, had resisted and covered the swelling on its surface. Behind the rectum was a gelatiniform mass freely supplied with blood-vessels."

Melanotic cancer or sarcoma is very rare. I have only seen two cases, and in both of these the disease was practically confined to the anus and the lower inch of the bowel.

## CHAPTER V

### RECTAL CANCER—DIFFERENTIAL DIAGNOSIS

WITH an ordinary amount of experience in rectal examinations, and after a careful consideration of the history and symptoms, there are few disorders liable to be confounded with rectal cancer. Nevertheless, at times considerable difficulty may be experienced in forming an accurate diagnosis. Omitting rare and exceptional diseases, the following include the chief disorders liable to be mistaken for rectal cancer :—

- |   |  |
|---|--|
| 1. New growths in rectum.               | { <i>a.</i> Villous tumour.<br><i>b.</i> Disseminated polypi.  |
| 2. New growths outside rectum . . . . . | { <i>a.</i> Tumours of prostate, bladder, and uterus.<br><i>b.</i> Tumours of sacrum and pelvic bones. |
| 3. Inflammations . . . . .              | { <i>a.</i> Abscess.<br><i>b.</i> Fibrous stricture.<br><i>c.</i> Tubercular ulceration.               |
| 4. Misplaced uterus.                    |  |
| 5. Chronic enlargement of the prostate. |  |

**Diagnosis from Villous Tumour.**—Villous tumour differs so entirely from the ordinary laminar form of malignant disease that it could not be mistaken for it, and it is in the somewhat rare form in which large fungating masses of cancer protrude into the bowel that the difficulty of diagnosis arises. The duration of the disease is here of considerable importance. When true cancer produces a fungating tumour in the rectum, its course is always most rapid. On the other hand, a villous tumour may remain for months, or even years, with little change. Then the discharge differs materially in the two diseases.

In villous tumour the discharge, though very free, resembles normal mucus, being viscid but fairly clear, and as it dries on the linen faintly stains it, making it harsh, as if starched. The discharge may from time to time be blood-stained, but there are nearly always intervals when it is quite clear. On the other hand, in cancer it is generally darkly stained, being mixed with discoloured blood and fæcal débris.

On examination a very different sensation is conveyed to the finger by the two disorders. The villous tumour has a peculiarly soft velvety feel, while, at the same time, it gives the impression of being fairly tough and resistant. The fungoid cancer, on the other hand, though soft on the surface, is very friable, bits readily breaking off on pressure by the finger-nail, and the least touch producing hæmorrhage. The surface of the growth feels harsh to the finger, as if from an absence of mucoid secretion. In villous growth, not only is the surface soft, but the whole mass feels so also, while in cancer the deeper parts convey a hard rigid sensation.

In villous tumour the bowel near the margin of the growth feels soft, and moves in a normal manner on the surrounding parts. On this account it can often be partially invaginated and drawn down nearer the anus. In cancer the bowel is hard at the margin of the growth, and is generally, at least to some extent, fixed to the surrounding parts, and cannot be drawn down.

A large villous growth may be present in the rectum with very little disturbance to the general health, while, in a cancerous tumour of this nature, there is much cachexia, and marked wasting.

Lastly, if a little portion be broken off with the finger, and submitted to the microscope, confirmatory evidence of the one or other form of growth can be obtained (*see* page 80.)

**Disseminated Polypi.**—The symptoms often have a close resemblance to those accompanying cancer. Here,

again, the duration of the disease becomes important, for the record of symptoms extends in polypi over many years. In disseminated polypi there is often a clear mucoid discharge similar to that in villous growth. There is frequently hæmorrhage, but the blood lost is generally pure and bright-red in colour, and has not the dark, treacle-like character, and free mixture with fæcal débris of that commonly observed in cancer. A digital examination shows the nature of the disease. The soft isolated growths with well-marked pedicles, and an absence of induration at their bases, disclose the nature of the disorder.

It must not, however, be forgotten that after many years of innocent life one of these polypi may take on malignant action and assume all the characteristics of adenoid cancer. The following case proves this point :

A. C., aged nineteen, was admitted under the care of my colleague, Sir Thomas Smith,\* in 1881. So far as was known, he was a healthy child until nine years of age. It was then noticed that, after being exposed to cold one day, he had considerable hæmorrhage from the rectum. Six months later a bleeding protrusion was occasionally observed after defecation. He was admitted into a hospital, and the protrusion removed when he was eleven years old. The symptoms were temporarily relieved, but returned again in a couple of years. He was again subjected to operation, with only slight relief. Since that time he has on three occasions, at St. Bartholomew's and other hospitals, had growths removed from the rectum, but without permanent benefit. When admitted into St. Bartholomew's he was extremely anæmic, having suffered severely from hæmorrhage for some months. His pulse was rapid, and he seemed scarcely in a condition to bear even an examination. After a few days' rest in bed he recovered from his collapsed

\* St. Bart.'s Hosp. Reps., vol. xxiii. I am indebted to Sir Thomas Smith for permission to use these notes.

condition, no more bleeding having occurred, but there was a free mucoid discharge. On examination under chloroform with the sphincter dilated, several mulberry-like growths were observed, varying in size from a pea to a filbert. Some of these had little or no pedicle, while others had well-marked stalks half an inch in length. The growths were soft, nor was there any induration about the mucous membrane from which they sprang. By the aid of a duck-bill speculum, from twenty to thirty distinct polypoid growths could be seen; besides which, others could be felt higher up the bowel by the finger, which failed to define any limit to the diseased condition of the bowel.

Sept. 1883.—Again admitted, and some of the larger and more accessible growths removed.

March 1885.—Re-admitted for severe hæmorrhage, when some more polypi were removed. At this time he complained of some pain in the left lumbar region, and a circumscribed area of dulness was detected in this part. There was also tenderness on deep pressure.

Jan. 1887.—Was admitted suffering great pain and frequent loss of blood. Several large growths were removed, and he left the hospital, free from his symptoms, to resume his work as a waiter.

March 15, 1887.—He was brought in in a moribund condition, his friends stating that since his last discharge from the hospital he had suffered dull, aching pain in the abdomen; that two days since he was seized with violent cramping pain in the lower abdomen, and sickness. He had taken no food for two days. He had had constant hiccough. On examination, he was found to be moribund, with the signs of peritonitis, and he died next day.

On post-mortem examination, he was found to be suffering from adenoid cancer of the lower part of the sigmoid flexure, and there was at this point an almost impervious stricture of the bowel. The rectum below this contained a large number of polypoid growths similar

to those that had been removed during the patient's lifetime; above the seat of the cancer there were but few to be found, and in the ascending and transverse colon not more than three or four, and these were small and rudimentary.

The larger number of the polypi were more or less globose, having slender stalks, but here and there were ribbon-like, ragged, slender, branched-out growths, and some few of the smaller growths were sessile. On microscopic examination the polypi proved to be well-marked examples of the adenoid variety.

There was a considerable deposit of adenoid cancer just at the junction of the sigmoid flexure with the rectum, surrounding the bowel, and almost obliterating its canal. The rectum, where it passed over the concavity of the sacrum, was adherent to the neighbouring parietal peritoneum.

The large intestine above the stricture was enormously distended by fæces. The peritoneum over the anterior longitudinal muscular band of the cæcum had been split by the excessive stretching. There was no effusion or peritonitis, the other organs were normal.

**New Growths outside Rectum.**—Occasionally tumours growing in the pelvis and surrounding or pressing upon the bowel may be mistaken for rectal cancer. Such tumours originate either in front or behind. When in front they either spring from the bladder, prostate, or vesiculæ seminales, and in the female from the uterus or ovaries. When arising in front there is, as a rule, not much difficulty in the diagnosis. Partly from the history of the case, but chiefly by careful physical examination, it can be discovered that the earlier symptoms pointed to bladder or prostatic trouble, while it can generally be determined by examination that the organs mentioned are chiefly invaded by the new growth.

A point, again, that is of considerable service in the diagnosis is the nature of the discharge from the rectum.

In rectal cancer, although at first the disease spreads in the submucous tissue between the mucous and muscular coats, it quickly gives rise to an ulcerated surface from the destruction of the mucous membrane over it, while this ulceration in its turn is accompanied by a blood-stained grumous discharge. On the other hand, when the disease arises external to the bowel, it may cause considerable stricture, either by direct pressure, or, by the fascia surrounding the rectum being drawn towards the growth, yet the rectal mucous membrane remains intact, and although other symptoms of stricture are present, there is an absence of the fetid sanious discharge so common in malignant disease. Sometimes, however, the diagnosis is of great difficulty.

The following is a case in point which I attended for some time in conjunction with Mr. Montagu Smith :

A gentleman, aged sixty-nine, of a highly nervous and desponding disposition, dated his trouble from eight months previously, when he was seized suddenly with pain in the left iliac fossa. This, however, soon passed off.

On first getting up in the morning he has a desire to stool, but generally only passes some gelatinous-looking mucus. The amount varies much, being sometimes slight, sometimes considerable. Sometimes it is fairly clear, at others stained with fæcal material not tinged with blood. He is often constipated for days together, at other times requires to visit the closet frequently, passing loose motions without a sense of complete relief, and very rarely passing any blood. He often feels discomfort about the lower part of the bowel, but with the exception of being much troubled with wind, suffers little actual pain. He has lost flesh during the last year, and very markedly so within the last ten weeks.

*Examination under Chloroform.*—The anus was normal, with a weak sphincter. The bowel itself, as far as the finger could reach, was natural. In front of the anterior wall, about the position of the base of the bladder,



was a large, firm, oval, swelling feeling like the half of a cricket-ball. It appeared to be situated behind the prostate, though continuous with it. It compressed the rectum between itself and the coccyx. Taking into consideration the somewhat rapid way in which the symptoms had developed, the emaciation of the patient, and the size of the swelling, I came to the conclusion that it was a case of malignant disease affecting the prostate, and consequently gave an unfavourable prognosis.

During the next year I saw the patient on two or three occasions. But owing to nervousness he stoutly refused to be examined. The only new symptom which he had developed was the occasional passage of air through the penis, and, later on, the urine at times contained a blood clot, and a dusky deposit, probably fæcal.

At the beginning of 1886, a year and a half after I had first seen the patient, I was again asked whether I still considered the disease to be malignant. At this time his appetite was good, he had plenty of strength, and emaciation had apparently ceased, and he had comparatively little trouble with the bowel, but suffered from a certain amount of cystitis.

I had not the advantage of an examination, but considering that his general condition seemed to be no worse than it had been a year and a half before—indeed, one would say there had been an improvement during the last few months—I had grave doubts whether my original diagnosis of cancer had been correct, and I expressed a more favourable view of the case, considering that the enlargement originally felt about the prostate might have been either of a fibroid, or, more probably, of an inflammatory nature.

The patient's condition remained stationary for some months after this. Then the urinary troubles, together with symptoms of obstruction, quickly increased, and he died in a little less than two years after my first examination.

A post-mortem was fortunately obtained. A mass of cancer was found involving the prostate, from whence it had extended into the cellular tissue around the rectum, causing almost complete occlusion of the bowel.

This case shows an exception to the general course of malignant disease, for the patient's condition, instead of progressing steadily from bad to worse, remained practically unchanged for more than a year and a half. Moreover, the case is instructive as showing how unwise it is to express an opinion as to the nature of a disease without proper examination.

Doubtless the implication of the rectum occurred many months before death, and with the certain diagnosis that an examination would have afforded, a colotomy should have been strongly advised.

Another case, which I saw in consultation with Dr. Allen Sturge, of Nice, was also an example of a difficulty arising in diagnosis between tumours external to the rectum and those involving the bowel.

A gentleman, aged sixty-two, dated his illness from about six months previously. At that time he suffered much pain in the right iliac fossa, shooting down the thigh to the testicle. The pain continued, coming on at night, and causing him to wake up. The bladder was at times irritable, and he passed water three or four times in the night, and every two hours in the daytime. There was considerable discomfort about the bowel, but the actions were fairly regular.

*Examination.* — Sounded. No stone found in the bladder. By the rectum a large irregular mass could be felt. It appeared as if divided into two distinct lobes, one in the middle line very hard and prominent, and one on the right side. Each lobe was about an inch and three-quarters in diameter; they were of a stony hardness, and covered with mucous membrane. The middle lobe gave the impression that it was an outgrowth from the posterior border of the prostate. The large mass on the right side

probably also proceeded from the prostate. Nevertheless, it gave the idea that it was growing from, or fixed to, the pelvis somewhere about the region of the spine of the ischium. The patient died six months later, the urinary troubles increasing, but he had little trouble with the rectum, pretty clearly showing that the source of the disease was prostatic and not rectal.

A case is described in "Diseases of the Rectum," p. 277, which is a good example of a growth encroaching upon the rectum from the pelvic bones.

**Diagnosis from Inflammatory Disorders.**—This had better be considered under two conditions—the one, acute inflammation, leading to suppuration or sloughing, the other, chronic inflammation, ending in permanent thickening or stricture.

**From Acute Inflammation.**—The three following cases well illustrate the difficulty that may arise in making a diagnosis between acute inflammation and cancer :

Mr. D., aged fifty-two, with a strong family history of cancer, was recommended to me by Dr. Bright, of Glastonbury. About a year before he noticed that he was getting weak and somewhat thinner than usual. The weakness decidedly increased during the year, but he had a fair appetite. During this period he had suffered some slight, vague pains about the rectum, but not sufficient to induce him to take medical advice. There has been no diarrhoea or discharge of any kind ; he has never passed any blood, nor, until recently, had he pain on going to stool. Three weeks ago, for the first time, he had severe pain about the rectum, and this has continued ever since, prevents sleep at night, and he has some difficulty in passing his water. Great pain was caused by introducing the finger. The interior of the bowel felt slightly œdematous, and the vessels pulsated strongly, and an indefinite hardness could be felt about as high as the finger could reach.

Half a pint of warm water was injected, which did not return till a rectal tube was passed. It then came back,

only slightly tinged with fæces, but it contained several white flaky membranous shreds.

I rather suspected an abscess, but the case was not clear. A week later there was a copious discharge of pus from the bowel, which gave immediate relief to the symptoms, and confirmed the view that the case was merely inflammatory.

A sailor, about thirty years of age, was admitted into St. Bartholomew's, under the care of my colleague, Mr. Bruce-Clarke. He stated that he had suffered great pain about the rectum for nearly a month. On examination, a deep cavity could be felt, on the anterior wall of the rectum, an inch and a half across. The walls of the cavity felt hard, but the edges towards the mucous membrane were fairly soft and not everted. Considerable doubt was felt as to the nature of the ulceration, as to whether it was a breaking-down malignant mass, or a cavity left by the bursting of an abscess. No history could be obtained of any sudden discharge of pus. Chiefly on the ground of the absence of eversion or induration of the mucous membrane edge, we considered the trouble most likely to be inflammatory. This proved to be correct, for it ultimately completely filled in, and the patient was discharged well.

A gentleman, aged thirty-six, was sent to me by Dr. Doig, of Ross. The patient, for the last six years, has been occasionally troubled with piles, but, as a rule, has enjoyed good health. Four months ago he had more decided discomfort about the rectum, but no actual pain until the last five weeks. One afternoon, at that time, he felt so ill, and had so much pain about the bowel, that he went to bed. The pain remained very bad for four or five days. He then took a large dose of purgative medicine, and had a copious evacuation. He also thinks that, after the motion, some matter came away from the bowel. After the evacuation the acute pain left him. A sensation of weight and discomfort has continued, and there has been some slight discharge.

On examination, at about an inch and a half up the bowel, partly on the side and partly on the front wall, was a swelling beneath the mucous membrane. It was somewhat ill-defined at the borders, but prominent in the centre, was fairly soft, but certainly did not fluctuate, and was about an inch and a half wide from above downwards, and a little more from side to side. I could not make a certain diagnosis, but, from the history of the case, I was inclined to regard it as inflammatory. I never saw the patient again, but Dr. Doig has kindly supplied me with the following information :

“ For the next year after you saw him he remained in much the same condition ; acute symptoms then set in. A large abscess formed, which was opened, and in the end led to the formation of a fistula, which still remains. He enjoys fair health, and the fistula gives but slight annoyance compared to his former suffering.”

**From Fibrous Stricture.**—In the great majority of instances a practised finger has little difficulty in recognising the distinction between fibrous and malignant stricture. Nevertheless, the most skilful practitioner will at times meet with cases when an accurate diagnosis is extremely difficult. The following case may serve as an example. A patient, aged thirty, was sent to me by Dr. Brook of Lincoln. She had various opinions about her case, but her disease was generally considered to be malignant. The patient was a remarkably fine healthy woman and a great huntress. For a year and a half she had suffered from constipation which was getting worse. At times she will feel completely blocked up and the abdomen swells, and she can pass neither motion nor urine. After a day or so she will pass a little motion and a lot of urine, then feeling better. She has no diarrhoea, but occasionally passes a little mucus but no blood. Has not lost flesh. Examination under chloroform showed a normal anus. At three inches up the bowel the lumen seemed to be blocked with a dense hard mass. It appears to divide

into nearly equal masses very convex and each the size of a bantam's egg. Between these was a narrow slit which would not admit the tip of the finger. This afterwards proved to be the entrance to the bowel, there being a deep cul-de-sac on either side of bulging masses. It was subsequently found that the mass was about two inches in length and quite an inch thick and was very fixed. Per vaginam Douglas's pouch occupied by a densely hard mass continuous with that in the rectum. The uterus only moved slightly. So far as I could feel, the mucous membrane was intact over the swelling though pretty firmly adherent to it. It was partly owing to this fact that I considered this case to be fibrous and not malignant. Nevertheless I was in considerable doubt as to the nature of the case. In the presence of Dr. Clement Godson and assisted by Mr. Brook I made a complete posterior division through the whole mass of the stricture right back to the anus. The cut section was densely hard and about three-quarter inch thick. After a fortnight a No. 12 bougie was introduced and kept in daily for half an hour. It was difficult to pass on account of the cul-de-sac on each side of the divided stricture. The patient went home after ten weeks with directions to pass the bougie twice a week. She soon recovered complete control and lost all her old symptoms. Three years later she married, and afterwards being pregnant, came to consult me on Dr. Godson's advice whether the rectal trouble would interfere with labour. On examination nearly five years after the operation I found the patient remarkably well and six months pregnant, the rectum giving no trouble. She was subsequently delivered of a 10 lb. baby without the slightest trouble.

I will now draw attention to a few symptoms which may assist in forming an opinion.

*Time.*—This is an exceedingly important consideration in determining the question of malignancy. Although malignant disease may be of a somewhat chronic nature,

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it must be remembered that when it has advanced sufficiently to produce well-marked stricture its course is comparatively rapid, and a fatal termination not far off. With a considerable experience of these cases, I know but a single instance in which the patient has survived three years after the symptoms of stricture became prominent. Indeed, as a rule, the time is far less than this, the survival even for a year being exceptional. It may be safely assumed, therefore, that, if well-marked symptoms of stricture have existed for over three years, it is improbable that the case is one of cancer.

The following case illustrates the importance of this time element, and shows how an exceptionally careful surgeon may form an inaccurate diagnosis by omitting its consideration :—

M. A. B.\* was admitted into St. Bartholomew's Hospital, March 1874.

“Three years ago, after her last confinement, she was troubled with piles, never before having had any pain or disorder of the bowel. Since that time has had increasing difficulty in passing her motions. From time to time she passed blood in small quantities. She was often seized with pain and straining during the day, sometimes ten to twenty times, after which a fluid motion passed. The motion was very seldom solid, and when so was no bigger than a pipe-stem. She had never noticed discharge of matter from the bowel, and there was no history of syphilis.

“Upon examination there was seen a ring of small pale external hæmorrhoids, and the finger introduced into the bowel detected a funnel-shaped cavity leading from the anus down to a stricture situated three inches from the orifice. The rectal walls were hard, nodular, and thickened. The stricture was annular, edges thick and indurated, and was so tight as not to admit the little finger. When examined by a speculum the stricture

\* Sitwell Ward Register, St. Bartholomew's Hospital, vol. iii. p. 33.

presented a ragged ulcerated edge of ashy-grey colour. After a short treatment by bougies she was discharged uncured from the hospital, and the disease was considered by the late Mr. Callender to be malignant."

The above record I have abstracted from the excellent notes of Mr. H. T. Butlin, who was then Surgical Registrar. The abstract I have had by me for some time, and the case had excited my interest on account of the rareness of malignant stricture lasting so long. I could, however, obtain no further history of the case. In 1882 M. A. B. again turned up at the hospital, and being admitted I had an opportunity of examining the patient, which I need hardly say I did with considerable interest. Of course, with the knowledge that the symptoms had now existed for ten years, it was absolutely certain that the case was not one of cancer. Yet I am confident that at the time of my examination a diagnosis could not have been certainly established apart from the history of the case. The parts were bathed with a foul discharge, and she had no control over the fæces, which ran partly from the anus and partly from a hole in the vagina. The parts about the posterior vaginal wall and the stricture felt hard and irregular, while the bowel was firmly fixed to the neighbouring parts. Her general condition was one of debility with emaciation, and would have corresponded well with the cancerous cachexia. The stricture was a fibrous one, and she was greatly improved by appropriate treatment.

*Discharge.*—In malignant stricture the discharge, if not at the beginning, certainly before very long, is generally dark and blood-stained. In fibrous stricture, on the other hand, it may for months and years be comparatively slight, and more resembles thin pus. It is true, that, in advanced cases of fibrous stricture, where there is deep ulceration, the discharge may be of a dark coffee-ground colour, as in cancer.

In cancerous stricture there is often a marked tendency to bleed. Bleeding is exceptional in fibrous stricture,



This is particularly marked after an examination. In the one case, even the gentlest introduction of the finger may cause bleeding, while in the other, even introduced roughly, it seldom excites hæmorrhage.

*Condition of the Bowel below the Stricture.*—In malignant disease this portion of the bowel is generally comparatively healthy, in fibrous stricture it is seldom so, and the bowel, instead of feeling soft and velvety, conveys a hard, creaking sensation to the finger, the mucous membrane being irregular and adherent to the subjacent tissue, sacculated in some places, and nodular in others.

The stricture itself feels different. In malignant disease the lower border is abruptly marked, and there is often all round it an everted, hard, nodular ring marking the border of the advancing disease on the mucous membrane. This nodular border is absent in fibrous stricture. The entrance into a fibrous stricture may sometimes be felt like a small orifice in the centre of a kind of diaphragm, but far more commonly the contraction is gradual, as if the finger were being passed into the apex of an extinguisher. Fibrous stricture is softer and less rigid than a malignant stricture.

Careful examination should always be made of the inguinal glands, for, though rectal cancer frequently runs its course without these being implicated, nevertheless they often become infiltrated when the cancer has been some time in progress, and has encroached upon the anus. The absence of glandular enlargement therefore proves nothing, but its presence would be of the highest diagnostic value. The general weakness and malaise forming the group of symptoms known as cachexia, although not always absent in simple stricture, generally form a very marked feature in malignant disease.

In conclusion, I believe that it is occasionally impossible to express a positive opinion as to the nature of a stricture until the case has been some weeks under careful and continuous observation.

**From Tubercular Ulceration.**—There is a rare form of ulceration about the anus and rectum as to the nature of which all authorities are not agreed. Some describe it as lupus, some as rodent ulcer, while others regard it as of a tubercular nature. I am not familiar with lupus in this part of body, but I have seen an ulceration here which so closely resembles in its appearance and course the rodent ulcerations met with on the face that it is probably the same disease. Such a case is described on page 186, "Diseases of the Rectum,"\* but the peculiar ulceration to which I am about to refer seems rather to be of a tubercular nature. In some of its features it closely resembles epithelioma, but I have little doubt that it is not cancerous.

The two following cases will serve as illustrations of this rare disease :—

A gentleman, aged thirty-five, seen in consultation with Dr. F. O. Smith and Mr. Pepper, had always been an active man with good general health. Thirteen years ago he had an ischio-rectal abscess which ended in a fistula. This fistula, with the exception of a little weeping, gave hardly any trouble till three years ago, when the parts inflamed, and owing to the pain he had the fistula operated upon. The wound healed very slowly, indeed part of it never healed at all, for there remained a large tunnel running up the ischio-rectal fossa for about an inch and a half outside the bowel. The canal ended in a cul-de-sac, and was of such a diameter as would readily admit the index finger. Until eight months ago this large sinus gave little trouble, there was always some discharge from it, but it gave no pain. At this time he noticed that he was gradually getting very constipated, having to strain a good deal to pass his motions. These troubles continued to the present time, and he has lost much flesh during the last six months.

Seven weeks ago, owing to pain and inflammation

\* Third Edition, 1907.

about the anus, he was again examined. Two or three fistulous openings were found in the anal neighbourhood, one being as far forward as the scrotum. Three fistulous channels were freely laid open, and I was asked to see the patient because the wounds had refused to heal. On examining the part, the anus appeared to be quite gone, as if an excision had been performed. A circular opening existed, about one and a quarter inch in diameter with a thin cicatricial margin. The skin adjoining the margin was thin and smooth, having a white cicatricial aspect. On looking into the cavity that represented the anus, the rectal orifice could be seen, and on passing the finger into this, the mucous membrane felt fairly healthy, but was much contracted.

The narrowing gradually increased as far as the finger could reach, at which spot it fitted the finger-tip, with no room to spare.

On each side of the bowel, running up for a couple of inches, were two channels, each large enough to admit the index-finger. The sides of these channels had a hard, harsh, nodular feel, so that the two formed rigid tunnels. A probe, introduced into the fistulous opening referred to in the perineum, passed five inches downwards, but it did not enter the rectum or either of the hard tunnels. We were in doubt as to the nature of the disease. The hard, nodular condition of the tunnels suggested epithelioma, but, with this exception, the general character of the disease scarcely accorded with cancer. The discharge especially was unlike that found in cancer. It was scarcely blood-stained, almost free from odour, and had a healthy, gelatinous look.

The induration referred to, though very marked in the tunnels, did not affect all the ulceration, and some superabundant granulations covering part of the ulceration were soft. Mr. Pepper informed me that colotomy was performed soon after my visit, with relief to the symptoms of obstruction, and that the patient lived for just a year,

getting gradually weaker, the urine containing more than half albumen. The sinuses discharged as freely as ever. There was no fungating growth, spread of the disease, or anything new to suggest that the disease was cancerous.

A woman, aged about thirty-five, kindly sent to me by my friend, Mr. Sankey, of Oxford. A year ago an abscess formed and burst by the side of the labium. A few months later a fistula was found on the anterior rectal margin. This was freely laid open by Mr. Sankey, and the sphincter divided. The wound thus made refused to heal, notwithstanding many changes of local treatment.

On the front wall of the rectum is an ulceration the size of a half-crown. It is covered by some red, irregular granulations. It feels soft on direct pressure with the finger; neither are the edges, which are scarcely raised, indurated. With one finger in the rectum and one in the vagina, there is some hardness felt about the base of the ulcer. The lower border of the ulcer is close to the anal verge, and at one spot the thickness between it and the vagina is no more than that of a penny. A hole in the centre of the ulcer leads into the rectum again an inch higher up. Mr. Sankey tried scraping and the cautery, but the part refused to heal. The ulcer was then excised, and the patient got well.

**Ossifying Ovaries mistaken for Rectal Cancer.—**

In 1903 I saw, in consultation with Sir William Bennett, a lady, sixty-one years of age. During the last five years she had occasionally some sharp attacks of pelvic pain. During the last six months she has had almost constantly a dull aching pain with considerable irritability of the bowels, requiring to go to stool five or six times a day, with a sensation of the bowels never being quite relieved. There has been no blood or discharge. She has consulted many surgeons, and "had been advised a colotomy for malignant disease." On examination under ether, *per vaginam*, a lump could be felt in Douglas's

pouch. Bi-manually it was free of the uterus. On examining by the rectum at four inches up the bowel the finger came upon a densely hard tumour, so hard that it felt like a stone, and about the size of a hen's egg. The tumour seemed to be situated in the bowel, which had become invaginated at the spot, so that a considerable cul-de-sac lay all around it at least two inches deep in front. The tumour appeared to have a double thickness of mucous membrane over it, as if it might be a growth higher up the bowel that had invaginated a double fold of the bowel. The most careful attempt was made to pass the finger beyond the invaginated bowel and touch the supposed growth itself, but it could only be felt through the fold of the mucous membrane. It could be moved slightly from side to side, and pushed up to a small extent. I could not make up my mind as to its nature, but was inclined to think it might be a rectal concretion lodged in a pouch which had become invaginated by straining, as it felt too hard and movable for malignant disease.

I advised an abdominal section first with a view to accurate diagnosis, and, if possible, to deal with the tumour, as it was too high for access from below. On opening the abdomen, and passing the hand deep down into the pelvis, two hard masses were at once felt—that on the left the largest. This, with some little difficulty, was raised out of its bed. It could then be seen that the tumour had been lying in a deep pouch formed by the invagination of the anterior wall of the rectum, which it had gradually pressed downwards into the bowel below, the pouch being two and a half to three inches deep. It was now seen that the tumour was of the left ovary, about the size of a large duck's egg; it had a long pedicle, and was removed. It was roughly lobulated on the surface, and so densely hard that it could not be cut with a knife. There was a similar tumour, about half the size, of the right ovary some way down into Douglas's pouch. This also was removed. Subsequently the tumour was cut

across with a fine saw, and appeared to consist almost entirely of dense bone and fibrous tissue. The patient made a good recovery, and all her previous symptoms vanished (see Fig. 28).

**Fibro Muscular Tumour mistaken for Cancer.**—In November 1899 I was asked by Dr. Marshall, of Bexhill, to see with him the following case. Mrs. V., aged forty-eight, had for the last six months suffered with slight symptoms of bowel irritation. Until under

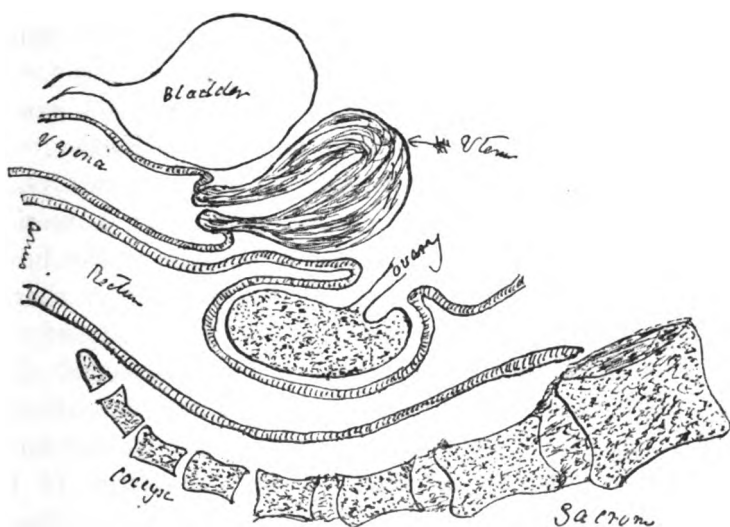


FIG. 5.—Diagram showing position of Calcified Ovary in an invaginated fold of the Rectum.

ether nothing could be felt, then just as high as the finger could reach a swelling the size of a bantam's egg could be felt high up in the anterior wall. It appeared to be in the muscular coat, the mucous membrane being intact over it, and moving slightly on the subjacent tumour. The swelling was so high up that only after considerable trouble in getting the finger beyond some folds of the bowel it could be felt at all. Operation. The rectum being split in the middle line behind, sufficient room was gained to seize the tumour with volsella, when it could be drawn down fairly within reach. The

mucous membrane was incised and the tumour dissected out of the muscular wall in which it seemed to be incorporated. A kind of pedicle was formed by dragging it out; this was transixed and the tumour cut off. The growth was not malignant, but rather a thickened lump of the muscular coat converted into dense fibrous tissue. No sinus or cyst could be found in its interior.

**Cyst of the Rectum resembling Cancer.**—Cysts of the rectum are extremely rare. I have only come across one case, and that is described on page 280 in "Diseases of the Rectum.\* The cyst with its thick walls might readily have raised a suspicion of cancer.

**Submucous Fistula resembling Cancer.**—A gentleman, aged forty-seven, sent to me by Dr. Kinsey. He had had symptoms of intestinal trouble for two years. Morning diarrhoea and occasional pain after a motion. On examination I found on the right side of the bowel two inches from the anus an ulcer rather larger than a shilling. The mucous membrane at the edges of this was elevated into a large villous-looking papilloma. The base of the ulcer was moderately hard, and beneath it a hard lump about the size of half a small walnut could be felt. I was very doubtful as to the nature of the lump, and advised its free excision. This was done; the lump was carefully excised with a quarter of an inch of healthy tissue around it. After removal a careful examination showed the following condition. In the centre of the ulcerated base a tiny hole was seen, admitting a fine probe. This led into a cavity about half an inch in diameter. The walls of the cavity were very hard, and one-sixth of an inch thick, composed of dense fibrous tissue. The cavity was lined with a soft granular membrane, and contained about half a drachm of mucus.

**Kidney mistaken for Rectal Cancer.**—I was asked by Dr. Frampton to see a gentleman, aged fifty, who had been pronounced by two very competent surgeons to be suffering from rectal cancer high up the bowel. He

\* Third Edition, 1907.

had had symptoms for two years, slight at first, but more troublesome lately. He suffered from wind and spasmodic pains in the belly. He had no actual diarrhoea, but an irritable bowel with a little discharge of mucus from time to time. I made a thorough examination under an anæsthetic, and made the following note : Bimanually a tumour the size of a hen's egg can be felt, but this can only be done by passing two fingers of the right hand high up the rectum, and pressing firmly down with the left hand above the pelvis. The tumour is movable. The fingers in the rectum cannot actually touch a growth, the tumour being felt apparently through some folds of mucous membrane. I had very little doubt that what I felt was malignant disease in the bowel, felt through some rectal folds. I advised an abdominal exploration in the left inguinal region, considering it might be possible to draw the growth up and excise it, or if not, a colotomy might be performed. The suggested operation was subsequently performed by another surgeon, who found the tumour was the left kidney flattened out against the brim of the pelvis. It was removed.

**Stercolith mistaken for Cancer.**—On pages 252–3 of “Diseases of the Rectum,”\* three cases of this rare disease are recorded, both of which were sent up to me as cases of cancer. The diagnosis can be made by a careful digital examination. At first the concretions could only be felt as hard, firm masses through a double fold of invaginated rectum, but with care and perseverance the finger could disentangle the folds, and actually touch the surface of the stony concretions with the finger tip.

**Uterus mistaken for a Cancer.**—It would seem scarcely possible that the uterus could be mistaken for malignant disease of the bowel, but yet I have reason to know that such mistakes are not infrequent. In some women the uterus has a tendency to tilt a little more forwards or backwards than usual, so that its long axis lies more or less at right angles to the rectum. In

\* Third Edition, 1907.



such cases, upon introducing the finger into the rectum, a hard, well-defined swelling can be felt on the anterior wall, encroaching considerably on the calibre of the gut. Occasionally this encroachment is sufficient to produce symptoms of partial obstruction. In those circumstances a hasty examination of the bowel leads to an error in diagnosis. A little further investigation, however, will soon correct the mistake. The mucous membrane is always smooth and intact, and glides over the swelling, which can itself be moved from side to side.

A bi-manual examination by the vagina and the rectum, of course, immediately clears up the nature of the supposed tumour.

**Chronic Enlargement of the Prostate.**—The situation of the swelling, and its firm, well-defined character, together with the fact that the rectal mucous membrane is healthy and intact over it, generally points to the innocent nature of the enlargement. A difficulty in diagnosis will, however, occasionally arise, such as occurred in the case recorded on page 99, but here, had a second examination been permitted, the alteration in the character of the swelling, and the fact of its extending round the bowel, would have made the diagnosis clear.

## CHAPTER VI

### TREATMENT OF RECTAL CANCER BY EXCISION

THE treatment of rectal cancer will be considered under the following headings :—

- (1) Excision.
- (2) Colotomy.
- (3) Palliatives.

The relative number of cases treated by these different methods will be found in Table D.

**Treatment by Excision.**—The name of Lisfranc stands prominently forward amongst the earlier advocates for treatment of rectal cancer by extirpation. The operation had been previously mentioned by Morgagni, and performed by Faget. During the earlier portion of the last century Pinault published some remarks on the subject, but the able paper read by Lisfranc before the Académie Royale de Médecine, March 24, 1830, together with Dieffenbach's many successful cases, were without doubt the leading cause that established the treatment of rectal cancer by extirpation in modern surgery. Some six or seven years later Velpeau described the operation, with some ingenious modifications, and gave the result of an extensive personal experience. About the same time Recamier's operations were published by Massé. In the year 1854 Chassaignac employed the *écraseur*. Maisonneuse in 1860, and Fumouze, Nussbaum and Schuh later, are all well-known modern authors on the subject, while Marchand's work, published

in 1872, was a valuable contribution. In America, Roberts,\* Briddon, Kelsey† and Professor Tuttle have done much in improving the operation. Dr. Tuttle's book, published in 1903, is the most thorough and comprehensive work on the rectum, while his chapter on rectal cancer is one of the best accounts of the disease yet written. In this country we are greatly indebted to Sir Alfred Cooper, Mr. Swinford Edwards and Mr. Eve for doing so much for establishing the operation on a sound footing. I may, too, perhaps claim that my prize essay of 1877 has not been without influence on the treatment of rectal cancer.

To the younger surgeons of the present day any question as to the propriety of removing a cancerous growth from the rectum in suitable cases might seem superfluous. Nevertheless, the general acceptance of this operation is of comparatively recent date. It is only thirty years ago that the Royal College of Surgeons of England set as the subject for the Jacksonian Prize Essay: "The possibility of cure or relief of cancer of the rectum by excision." At the time this prize was awarded the operation was never practised in this country, and merely mentioned in the text-books as a useless proceeding to be condemned.

As in the history of many other now well-established operations the pioneers were much abused. This preliminary criticism had its value, for it quickly produced in thoughtful and enterprising surgeons the desire to improve the methods of operating, which were soon followed by the operation becoming recognised as the most valuable method of treatment in suitable cases.

In discussing the treatment by excision the following are the chief points requiring consideration :—

\* Excision of Rectum for Cancer, Philadelphia Med. Soc., June 1887.

† An Analysis of 140 Cases of Excision of Rectum, *New York Med. Jour.*, December 1880.

- (1) Selection of cases suitable for operation.
- (2) Immediate risk to life involved.
- (3) Amount of benefit to be expected.
- (4) Best method of operating.

**Selection of Cases.**—It is of no avail to show that anatomy will allow and that there may be theoretically carried out a surgical operation, unless it can be further proved that, in a majority of cases, it is followed by beneficial results. There is scarcely an operation upon the human body which is not liable to be abused by the ignorant or enthusiastic, although in the hands of a discreet surgeon of the utmost value to the sufferer.

It requires much care to select cases of malignant rectal disease in which benefit is likely to result from its removal. Unfortunately, suitable cases are in the minority, for the symptoms are often overlooked or neglected until the disease has assumed uncontrollable proportions, or it may be that even from the first it was situated too high to admit of operative interference.

To regard excision as the ordinary treatment for all cases of rectal cancer is but to throw discredit upon the method; and the mortality following Billroth's operations should stand as a warning against the indiscriminate performance of excision.

In selecting cases for operation the general constitutional state of the patient, together with the local conditions of the growth, have both to be considered.

The same rules that would guide a careful surgeon before undertaking any severe operation must hold good in cases of rectal cancer. The age of the patient, his general strength, and the condition of the urine, must be taken into consideration, for an operation, which, in a middle-aged and comparatively healthy patient, is one of small risk, becomes extremely hazardous in the aged and feeble.

It will be seen on referring to Table E\*, that out of four deaths two of the patients were over seventy-

\* *Vide also* pp. 123, 249.

five years of age, and one aged sixty, an advanced drinker (page 387).

The abdomen must be examined to ascertain that the abdominal viscera and lumbar glands are not implicated.

If the general state of the patient be satisfactory, the local conditions of the growth should next be inquired into.

In dealing with cancer no operation should be undertaken without a reasonable prospect of its being possible to remove the whole disease. Under ordinary circumstances the finger can explore to a distance of from four to five inches. If the patient be told to strain down or the abdomen pressed with the hand, a slightly further distance of bowel can be reached. If at this examination the finger fairly pass beyond the disease in an upward direction, the next point to be ascertained will be the implication of the surrounding tissues, and the extent to which the disease has formed adhesions to the neighbouring parts. If the whole circumference of the bowel be involved, it will be found that it is attached more or less firmly to the surrounding structures, especially on its anterior aspect. It is of great importance to ascertain with some precision the extent to which the prostate, vagina or uterus are implicated. In the male, although the disease may be situated in that portion of the bowel in contact with the prostate, it is a long while before the prostate itself becomes infected; in women, on the contrary, when the disease is on the anterior part of the bowel, the vagina quickly becomes implicated. So long, however, as the vaginal mucous membrane remains free, it is possible to dissect the anterior wall of the rectum from the vagina without making an opening into the latter. If the disease is adherent to the upper portion of the vagina in the immediate vicinity of the uterus, the peritoneal membrane of Douglas's pouch is nearly sure to be drawn towards the disease, which cannot be removed without opening the peritoneum. In these

circumstances, it is better, save in exceptional cases, that no operation should be undertaken; not so much on account of the necessary opening of the peritoneal cavity, as that the disease, once having implicated this membrane, is nearly sure to have spread in the course of the lymph-paths beyond the reach of complete removal. It is well to remember in the female how near to the perinæum the peritoneal membrane descends, it being much more commonly at a shorter distance than three inches than at a distance in excess of that measurement. The cases in which invagination occurs, as referred to on page 85, must also be remembered. In these instances the origin of the disease springs from the bowel much higher up than might be supposed from the examination. Moreover, it is not improbable that a considerable fold of peritoneum has been drawn down by the growth in its descent.

I do not consider the implication of the lower part of the vaginal wall as necessarily forbidding an operation. Indeed, in one of my cases where this complication existed the woman did remarkably well, notwithstanding that a considerable portion of the septum had to be excised.

If the disease is confined to the posterior wall, the case is in every respect more favourable to the operation than when situated in front. In this position there are no anatomical difficulties to prevent the thorough removal of the disease to the extent of four to five inches, care being taken to ascertain, if possible, whether the coccygeal or sacral glands are involved. As a rule, glandular infiltration comes on late; if it is extensive, hard nodular masses lying behind the rectal wall can be felt.

To sum up briefly the general outline of the cases suitable for operation from below, I should say that the disease must be within five inches of the anus, and in women must not have extended on the anterior wall further than three inches, and that the rectum must be fairly movable on the neighbouring parts. If the growth

is higher than five inches above the anus, and if the disease is suitable for removal at all, the possibility of its removal by abdominal section should be considered. Each case will, however, have to be decided upon its own merits, after due consideration has been given to the surrounding circumstances. The distances just mentioned must only be considered as approximate. Should there be any doubt as to whether these conditions are fulfilled, a second examination under an anæsthetic is advisable before deciding absolutely against an operation. It has occurred many times in my practice to find, on such second examination, that a growth came readily within reach which had at first appeared too high up for safe removal.

I find from an extensive experience that the cases of rectal cancer which fulfil the condition rendering an excision advisable amount to about thirty per cent. of cases coming under observation.

**Risk to Life involved in the Operation.**—The difficulty of estimating with exactness the relative mortality following operations of an exceptional nature is notorious.

“The evil that men do lives after them,  
The good is oft interred with their bones.”

But whereas in surgical cases the operators are usually their own chroniclers, success is apt to survive in history, failure to pass into oblivion with the bones it consigns to decay. When statistics, however, are principally drawn from authors who publish the whole of their experience, this objection is in a great measure obviated, and data sufficiently reliable for comparison may be obtained.

In the earlier editions of this work it was necessary to rely a good deal upon the collective experience of others as to what risk is run in the operations, and as to what benefits may be expected. In this edition the deductions are entirely drawn from Table A, that is, cases occurring in my own private practice. The reason

of this Table being confined to private cases only is referred to later on.

In Table D, page 248, it will be seen that eighty-five cases were operated upon by excision out of a total of 380 cases. The whole number suitable for operation was considerably larger, but the operation, though advised, was on various grounds refused.

Out of the eighty-five cases (*see* Table E)—

Recovered, 81

Died, 4.

A death rate of 4.6.

The causes of death were as follows :—

Case 42.—Death on twenty-second day. The patient, an old gentleman of seventy-six, gradually lost ground. During the third week he became very weak, with wandering delirium, but the wound remained healthy throughout.

Case 145.—A lady, sixty years of age, died on the fourth day from peritonitis.

Case 329.—A lady, aged sixty, accustomed to large amount of stimulants, died on the thirteenth day from acute spreading cellulitis.

Case 371.—A lady, aged seventy-five, did well till the eighth day, when she died suddenly with symptoms of cerebral embolism. The wound remained quite healthy.

In the second edition of my work on "Diseases of the Rectum" a large series of cases by different operators was published, and the death-rate amounted to nineteen per cent., nearly all from sepsis. It must be remembered that a very large number of these operations were performed prior to the general introduction of aseptic surgery, whereas in Table E the operations were mostly performed after the rules of aseptic surgery had been well established.

By the ordinary antiseptic precautions at the time of operation, and great care in thoroughly washing the wound night and morning with soap and water, the case can generally be kept aseptic throughout. It does not matter how much faecal material passes over a rectal



wound, for it does no harm, and excites no inflammation. On the other hand, should any faecal matter or discharge be allowed to collect for twenty-four or more hours about the anal orifice, it will quickly decompose from organisms coming from without, and tenderness and local inflammation will result. Still, notwithstanding all precautions, two of my cases died of sepsis—a preventable cause which, it may be hoped, will be eventually eliminated.

**The Amount of Benefit to be Expected.**—The first question that arises is the one asked thirty years ago by the Royal College of Surgeons, namely, is it possible to cure the disease by excision? The whole subject of the surgical treatment of cancer is regarded in a far more hopeful way by surgeons to-day than it was thirty years ago. Sir James Paget, the greatest living English authority on cancer at that date, stated “that the number of cases in which cancer does not recur after operation is not one in five hundred.”\* I venture to say that no surgeon of to-day takes this gloomy and hopeless view. I am old enough to remember well Sir James Paget’s operations, and those of contemporary surgeons. The operations in those days were not comparable with those of recent times. The growth was generally cut out only from an organ, with scarcely any margin of safety, while glands were seldom interfered with. No wonder these cases were said to “recur.” As a matter of fact, the original growth was very rarely removed. It is far different now, when a wide margin is given, and often the entire affected organ removed, with clearing out of all glands affected. So far as general operations for cancer are concerned, surgeons can now claim quite a fair proportion of cures. As regards the rectum, which for the moment only concerns us, I can now speak very confidently as to the proportion of cases cured. Cancer of the rectum, speaking generally, is of a less virulent type than the same disease in many other parts of the

\* “Path. Soc. Trans.” vol. xxv. page 321.

body. It is far less liable to return than cancer of the tongue or bones, for instance, and is more in the category with cancer of the lip or the scrotum. A free removal of cancer from these regions at an early stage before glandular complications, often leads to a permanent cure. So, too, in cancer of the rectum, an early and free removal is followed by a good percentage of cures. I have not been able to follow all my cases of excision of rectal cancer, but taking the three years' limit, Table E shows thirty-two cases known to be well out of eighty-five operations, giving a percentage of 37.6 as cured. Many observers have taken the limit of three years as a period during which, if the disease has not recurred, the patient may be fairly considered as cured. As regards cancer of the rectum this view can be strongly endorsed. In Table G is shown the number of months after the original operation that a recurrence was noted. In all the thirty-one cases of recurrence, it will be seen that in twenty-four of them the disease again appeared within a year, that in six more within two years, while in one single case only did it recur later. The deductions from these figures warrant the statement that if a patient is free from cancer three years after operation, it is unlikely that the growth will ever return again, and the case may be considered cured.

The reader is now referred to a very important table—Table F; this shows the number of years that elapse between the operation and a subsequent date, when the patient was known to be in sound health, without signs of recurrence. The period extends to twenty years and more. In one case, No. 23, the disease twice recurred after short intervals, but it is now twenty years since the last operation, and the patient still remains well.

If the first four cases are excluded on account of the time taken as a standard for cure, three years not having been reached, and assuming that none of the seven un-

traced cases were cured, we have thirty-two cases known to be cured out of eighty-six operations, or a percentage of 37.2 successes, or if it is wished to put the subject in a more favourable light, there were only thirty-three known recurrences in eighty-two patients who survived the operations, or a return of the disease known to have occurred in only forty per cent.

**Condition of the Patient after the Operation.—**

**Relief from Pain.**—A most distressing symptom of rectal cancer is pain at the seat of the disease. This pain is in no proportion to the extent of the growth, and, indeed, is often more intolerable from a small cancerous ulceration involving the sphincter than from extensive disease in the higher part of the rectum. Complete relief from this pain is the first and most marked result of the operation. Indeed, the patient will often state on the morning following the operation that a better night has been passed than for months previously.

With the removal of disease not only is there cessation of pain, but also the tenesmus and blood-stained discharge ceases, and the patient rapidly improves in general health and strength. If the disease return in distant organs the suffering is usually inconsiderable, while in the event of a local return there appears to be very little pain compared with that caused by the original growth, a fact probably accounted for by the destruction of the terminal nerve filaments at the seat of operation.

The possibility of incontinence cannot be urged as a drawback to the operation, for if the cancer be allowed to remain unoperated upon, incontinence is nearly sure to become a complication.

In the majority of cases in which no return of the disease has taken place, there is practically perfect control over the bowel, while in others there is good control except when there is any diarrhoea or looseness.

It might be supposed that the destruction of the in-

ternal sphincter, and at the same time more or less damage to the external muscle, would be followed by an incontinence of fæces. In all cases, after operation, there is at first complete incontinence, and the patient loses all consciousness of the passage of fæces, but as convalescence advances control returns. In those instances where portions of the levatores ani have been left intact, the muscles, temporarily paralysed, probably regain their power, but when they have been wholly removed, retention of fæces requires another explanation. Chassaignac attributed it to an hypertrophy of the circular fibres around the termination of the cut margin, constituting a sort of rudimentary sphincter. Lisfranc considered that it depended most probably on the somewhat narrow, tortuous course through the cicatrix, assisted by the surrounding muscles. In the Bulletin of the Société de Chirurgie, 1861, an interesting discussion on this subject will be found. In the majority of cases it does not appear that hypertrophy of the circular fibres has anything to do with the power of retention, nor in cases that I have examined has any such hypertrophy been found. The common plan by which the passage of fæces appears to be prevented will be best gathered from a description of MacM.'s case, whose rectum I have frequently examined since the removal of two inches and three-quarters of bowel. She is able to restrain both wind and motions, as a rule, completely, but if she has any diarrhoea the linen is slightly stained. Upon separating the sides of the buttocks the anal aperture appears as an oval opening in the skin, one inch long by three-quarters wide. The margin of the opening is formed by a slight inversion of the skin. The edge is not hard, and admits of a certain amount of stretching; just within the orifice is seen a bright red protrusion, which, upon examination, is found to be a sort of prolapse of one side of the bowel, completely blocking up the opening. Very slight pressure enables the finger

to pass into the bowel. This valve-like approximation of the sides of the bowel would appear to be but a feeble guard against the passage of fæces, but nevertheless in practice it is completely efficacious, assisted by the contraction of what remains of the levatores ani.

It is probable in discussing this question of incontinence that sufficient consideration is not given to the normal method by which fæces pass from the bowel. It must not be supposed that there is always a mass of material just within the sphincter ready to pass away. In health, unless the bowels be very loose, a certain amount of straining by means of the abdominal muscles is necessary to bring the fæces against the sphincter, which eventually yields to the pressure, so that during the greater portion of the day the last few inches of the rectum is empty. Again, it must never be lost sight of that the chief agents brought into play to prevent, even in health, the passage of fæces, is the voluntary contraction of the levatores ani exerting a strap-like compression across the bowel.

**Contraction of the anal outlet** is often a trouble, and will invariably occur unless proper attention is paid during the healing of the wound. If stricture is allowed to take place, incontinence and a dribbling away of fæcal material will render the patient miserable, and may, as I have seen in one case, end in complete obstruction. Stricture, however, can always be prevented by early and proper treatment.

Taking into consideration that death is inevitable from rectal cancer if left alone, and that no other form of treatment holds out the slightest hope, there can be no possible question that it is the duty of every practitioner to advise an operation in all cases in which there is reasonable probability of removing the whole disease, for it converts, with a small immediate risk, the absolute certainty of death into more than a  $\frac{1}{3}$  thirty per cent. chance of a permanent cure.

**Method of Operating for Excision of the Rectum.**

—It is some years since I published the fourth edition of my work on this subject, and gradually, from the accumulative experience, I have considerably modified my original method of operating. The *écraseur* has been entirely done away with, and the use of the curved pressure forceps substituted, which has practically removed the risk of dangerous hæmorrhage. There are two plans of operating: the one where the disease is fairly accessible and movable, where, beyond the removal, perhaps, of the coccyx, no bone is taken away; the other, where the disease is high and extensive, involving a partial removal of the sacrum—the trans-sacral operation.

**Operation from Perinæum.**—The patient being prepared by half an ounce of castor oil administered not less than twenty-four hours previously, and by a warm water enema one hour before the operation, is placed under chloroform in the lithotomy position, and kept there by means of Clover's clutch. This consists of a metal bar eighteen inches in length, at each end of which is a semicircular padded crutch with a strap and buckles attached. The legs being flexed on the thighs, the bar is placed between them, so that the crutches fit against the legs just below the knee, and are kept in position by means of the straps and buckles. The thighs are then bent on the abdomen, and a soft leather strap passes over the head and one shoulder, and the free ends being then buckled to the crutch, the strap is tightened so as firmly to fix the thighs in a bent position. The patient is now lifted down to the edge of the table, a towel rolled into the form of a firm pad five inches in diameter being placed under the sacrum, so as to elevate the rectum, and get it into a good light. In the hospital a sand-bag can be used, but in private, a carefully rolled-up bath towel answers the purpose. The instruments required are:—Two strong scalpels; one straight blunt-pointed bistoury; one pair strong

### 130 RECTAL CANCER—TREATMENT BY EXCISION

blunt-pointed scissors; one pair strong sharp-pointed scissors; two large volsella forceps; eighteen pairs of pressure forceps, nine of them being curved (Fig. 6); two rectangular needles with large oval eye (Fig. 6a); one saw and one pair bone-cutting forceps—if sacrum or coccyx to be removed.

*Silk ligatures.*—These should be fourteen inches long, and of soft silk, so as not to cut through the tissues. The best plan is to get a skein of soft silk (Messrs. Arnold, Smithfield, E.C.) the thickness of No. 2 catheter. After cutting this into fourteen-inch lengths, it should be unravelled into its three primary strands, which will be found quite sufficiently strong, and can be threaded easily through the rectangular needles.

The left forefinger is now passed into the rectum, so that a clear notion as to the position of the growth is obtained. If the growth is small, and the bowel movable, it may occasionally be everted through the anus without splitting this part, but, in far the majority of cases, it will be necessary to divide the anus and the lower part of the rectum in the middle line behind.

Formerly I used to do this by transfixion with a strong curved bistoury, but I now generally split the bowel from below upwards; two fingers of the left hand being inserted keep the bowel open, so that the anterior wall is not injured. The two fingers being separated, the bowel is divided between them in the middle line by an ordinary straight scalpel, cutting from below upwards. The length of this posterior cut depends on the height of the growth. If the cut is carried up the bowel for three inches, which is about as far as the middle of the coccyx, this will generally be sufficient, but there is no reason why it should not be carried up further by the side of the coccyx or sacrum, if necessary. If a vessel is divided of any considerable size, which is exceptional, it can be temporarily secured by straight pressure forceps.

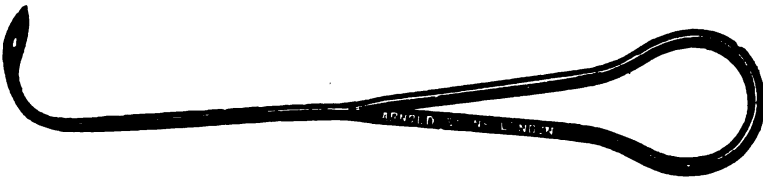
Assuming the whole circumference of the bowel is

**FIG. 6.**



**CURVED PRESSURE FORCEPS.**

**FIG 6A**



**RECTANGULAR NEEDLE**

*To face page 130.*





to be removed, the next step is its lateral separation. A sharp-pointed scalpel is now plunged through the muco-cutaneous surface, half an inch to one side or other of the middle line in front, into the ischio-rectal fossæ, and, by a slight sawing movement, cuts its way downwards so as to join the posterior incision already made at right angles, at about an inch within the anal margin. By doing this the main fibres of the external sphincter are left. The right forefinger thrust into this incision, separates the bowel as high up as may be necessary or is possible. During this separation with the right first finger, the left forefinger should be put into the bowel as a guide. The finger being used with some force, can easily separate the bowel laterally, but not in front or behind. In separating it behind, a pair of strong sharp-pointed scissors should be used, for the attachments of the bowel to the coccyx and the lower part of the sacrum are too firm to be separated by the finger. By cutting here and there, wherever resistance can be felt, the bowel is separated from its posterior attachments. It may be that it is not necessary to separate the bowel higher than the apex of the posterior incision, but it is often necessary to go far beyond this. If so, before continuing further separation posteriorly, the opposite or left side of the bowel must be treated in an exactly similar way as the right side. When these two lateral separations have been effected, it is much easier to deal with the firm posterior attachments, for the bowel is to a certain extent set free, and can be grasped by the fingers or by a volsella.

This posterior separation can be carried up as far as possible before commencing the anterior separation, but if the case is a high one, it cannot be completed till some of the anterior separation has been effected.

**Separation of the Anterior Wall.**—This is the most difficult part of the operation, and requires the utmost care, for it is easy enough to tear into the vagina

in a female, or into the urethra in a male. To avoid this in the male, it is a great assistance to have a full-sized catheter or sound in the bladder, which can be readily felt during the operation, and is a good danger signal against approaching too near the urethra, while, in a female, safety is only to be found by having a finger in the vagina from time to time during the dissection.

In separating the anterior wall, it is in the first two inches that the greatest trouble is experienced. The rectum is normally very adherent here, and will not strip with the finger, but requires careful dissection. After the first two inches or so, it separates much more readily, and, indeed, unless adherent from infiltration, will strip off the vaginal wall or the prostate fairly readily with the finger-tip.

The dissection is commenced by joining the anterior part of the two lateral incisions by a cross incision just within the anus. The separation here can only be effected by cutting with the scalpel and dissecting the rectal wall off, but, as already mentioned, the higher up the easier the separation. After the separation has been carried up about three inches in the female, but higher in the male, the peritoneum is not infrequently met with. In a good light it can be identified, and stripped from the anterior surface of the bowel.

At this period of the operation, the bowel, being detached laterally and posteriorly, can be grasped by the left hand and drawn forcibly downwards, bringing the anterior attachments into view before separation. It is, at this stage, that the peritoneum is so often opened.

If the disease is confined to the mucous membrane there is no necessity to open the peritoneum, and, if opened by accident, it can be closed. Although the danger in opening the peritoneum is very small, I have seen a case in which death took place from peritonitis from this cause, and, therefore, think it worth while to take some trouble to avoid it. In many instances

it cannot be avoided, but in many cases I have had deliberately to open the peritoneum, and take away a portion of it with the bowel as the only means of getting free of the disease. I have opened accidentally or purposely the peritoneum in some twenty-five to thirty cases in about 160 cases of excision, but I have only once seen it followed by septic peritonitis. With an opening into the peritoneum at the apex of the wound, care should be taken, not to push a dirty finger into it, but have the upper part of the wound and fingers kept thoroughly clean with lotion.

After a dissection such as has been described in the male, the lateral lobes of the prostate are clearly visible. If the dissection has to be carried higher than this, besides the peritoneum, the risk of wounding the bladder must be remembered, and here, the sound previously placed in the bladder is invaluable as a guide. I have twice accidentally opened the bladder in this region, but in neither case was any permanent damage done. For some days most of the water came through the wound. This gradually decreased in quantity, and by the end of the third week had entirely ceased, the opening doubtless having cicatricised.

In describing the operation, we have now arrived at the stage when the walls of the bowel have been completely separated from their lateral connections, the remaining stage being the cross section of the bowel above the disease. Up to this stage there has been comparatively little hæmorrhage, for the chief vessels running down between the coats of the bowel have not yet been divided.

Before effecting this transverse division, it is of the utmost importance to see that the bowel has been so separated laterally that it will admit of being cut across well above the seat of disease. With the left forefinger passed up the bowel, and the thumb outside, it can be readily ascertained between the finger and thumb whether

the proposed line of section will be sufficiently high to be quite clear of the growth. Examined in this way, the walls of the bowel in which the growth is situated will feel sometimes nearly an inch thick, while, if the finger and thumb can be passed beyond it, a somewhat abrupt upper border to the disease can be felt, the coats of the bowel beyond being soft, and comparatively thin. It is at this stage of the operation that the plan I introduced many years ago of using curved forceps is invaluable. The forceps shown in the accompanying Diagram\* are the actual size of those I find most useful. The bowel being drawn well down, the forefinger being inside and the thumb outside, one blade of a curved forceps, which must have not too blunt a point, is forcibly thrust through from the outside into the interior of the separated bowel, well above the disease. This manipulation is facilitated by the finger already within the bowel. The forceps are then clamped home, about a third of an inch of the whole thickness of the bowel walls being included in each forceps. The portion of bowel which is thus clasped is divided with the scalpel, cutting close against the curve of the forceps.

Through the opening thus made, one blade of another pair of forceps is introduced, seizing a further portion of the bowel, which in its turn is again divided. In this way, by using from six to ten forceps, the whole circumference of the bowel is clamped and divided in sections. At this stage of the operation the surgeon has his choice as to whether he will tie the cut edges included in the forceps, removing the latter, or whether he will leave the forceps *in situ* for forty-eight hours, without attempting to place a ligature beyond them.

Undoubtedly, it is more for the comfort of the patient and for the facility of nursing that the forceps should be removed, and I always tie and remove them, except where the excision has been a high one. In some of these high cases there is considerable mechanical difficulty

\* Page 130.

in transfixing and securing a good tight knot beyond the forceps, and it will not infrequently happen that the ligature is not properly tightened, and sharp hæmorrhage occurs when the forceps are removed.

Hæmorrhage at this stage of the operation is a troublesome complication, and difficult to deal with, for the vessels which were easily clasped when the bowel was being forcibly drawn down before its division, when divided retract almost beyond reach. In high cases, therefore, I usually leave on the forceps, except in the lower portion of the wound, where they are easily accessible for tying. In using the ligature, each portion should be transfixed behind the forceps, otherwise some of them will be sure to slip. For this transfixion is used a strong rectangular needle with a good large eye (*see Diagram*).<sup>\*</sup> In securing the edges of the cut bowel, the operator will appreciate the great advantage of a properly curved forceps over a straight one, there being comparatively little difficulty in getting the ligature over the tips of the forceps. Of course, this transfixion means a double knot.

The part to tie first is that towards the tip of the forceps. The two ends of the ligature are then brought down, and tied towards the handle part of the forceps, the tissues being relaxed by the forceps being partially opened at the moment of tying the knot. One end of the ligature is cut off short.

On completing the operation, I give the rectum a thorough wash-out with two or three jugsful of one in four thousand biniodide lotion. Before applying the dressings, a good look round should be made for any bleeding point. It is an easy affair whilst the patient is under an anæsthetic in the lithotomy position, in a good light, with your assistant present to secure the vessel. It is a very different matter to be turned out in the middle of the night with no table, no assistant, and no light, because the blood is smartly dripping through the dressings.

<sup>\*</sup> Page 130.

Of all disagreeables in a surgical practice, nothing comes up to a midnight recurrent hæmorrhage from one of your own operations. It nearly always occurs on a wet night when you are dead tired, the patient is anxious, and the friends alarmed, and there is never any extra fee, a combination of evils which, by proper care, may be avoided by securing everything before the patient is put back to bed.

Sometimes there is a little indefinite oozing on the completion of the operation which cannot be traced to any distinct vessel.

In order to prevent the risk of recurrent hæmorrhage, and to arrest oozing which cannot be dealt with by ligature, it is best to firmly plug the wound on completing the operation. It causes no pain, and, indeed, gives the patient a feeling of support and security.

*Method of Plugging.*—An india-rubber tube three-quarters of an inch in outside diameter, and of six to eight inches in length, to one end of which is attached a stout silk loop to facilitate withdrawal, is passed in, so that its upper end is an inch or two within the bowel. Round this, long strips of cyanide gauze are firmly plugged. Each strip should be cut by the nurse about a yard and a half long, an inch and a half wide, and six thicknesses. Four to eight of these strips may be required. To be effective this plugging must be done very firmly, when it effectively prevents oozing, while, should there by any possibility be serious recurrent hæmorrhage from a vessel, it at once becomes obvious by the blood coming through the tube. Plugging without a tube is always dangerous, for severe hæmorrhage may occur by the blood making its way up the bowel, the plug preventing it being detected.

After the plugging is complete, a muffin pad of cotton wool an inch thick, with a layer of lint on either side, cut to a circle nine inches in diameter, with a small hole through the middle to let through the india-rubber tube,

is applied, and any projecting part of which should be cut off flush with the pad, and the whole is kept in position with a T bandage.

*Application of the T Bandage.*—To put this on neatly and comfortably is material. Nothing irritates me more than seeing this untidily done, the bandage looking like the harness on a Connemara car. Patients are quite unable to appreciate the niceties of the most brilliant operation, but they are perfectly cognisant of whether the bandage cuts them, or is comfortable, and value the skill of their surgeon accordingly. The bandage should be of flannel, the waistband being of double thickness, four inches wide, and of sufficient length to go one and a half times round the body just above the hips. It should be put on, drawn tight, and the two ends flatly laid across, and pinned on either side. The two T pieces are then drawn over the dressing between the legs, and pinned eight inches apart to the waist bandage. A T bandage should be pinned, knots and bows being always uncomfortable.

The operation, as just described, is for the removal of the whole circumference of the bowel. Cases, however, will occur in which the disease affects only a small part of the circumference, and in such cases it is not necessary to remove the whole bowel. So far as the operation itself is concerned, it is certainly easier to remove the whole circumference of the bowel than a portion only, but since one of the chief troubles following the operation is contraction of the outlet, and this contraction rarely occurs to an inconvenient extent, unless the whole circumference has been removed, it will be seen that if any considerable portion of the bowel be quite free from disease it may be left with advantage. In these circumstances the operation requires a slight modification of the method just described. In any case, even if the disease be situated in the middle of the posterior wall, the preliminary incision backwards is advantageous, greatly facilitating the operation.



If the diseased tissue be confined to the lateral portion of the bowel on either side, the semicircular incision round the anal margin is made only on the diseased side. A longitudinal cut is now made with the scalpel deeply through the mucous membrane on the middle line of the anterior wall, or, at such a distance from the site of the disease as may seem desirable. The making of this incision is much facilitated by using a very large duck-billed speculum. The strip of diseased bowel which now lies between the posterior incision and the one just made in front can be separated by the finger from its lateral connections, the separation of course commencing from the semi-lunar incision round the anus.

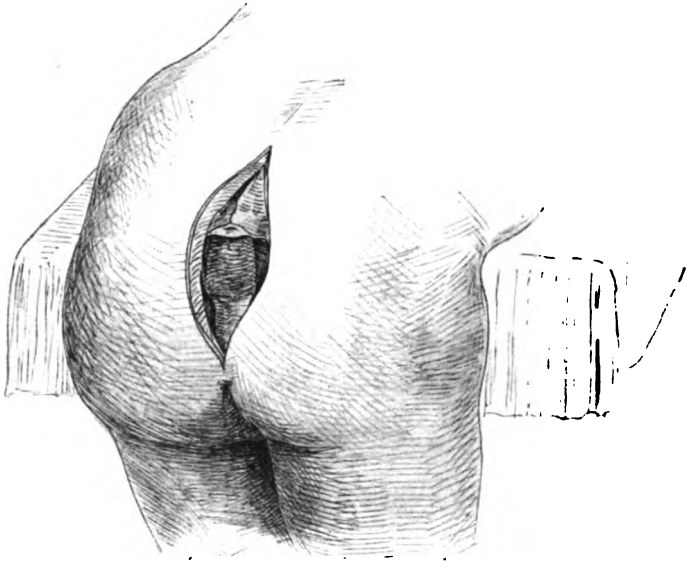
In this way the rectangular flap of bowel in which the disease is situated is detached, except at its upper margin. It is then drawn down, and after being clamped with two or three pairs of curved forceps, is cut off, and the tissues, grasped by the forceps, tied in detail by transfixion. It can be readily understood how the steps of this operation must depend upon the portion of bowel in which the disease is situated. If it be in the middle line behind, the disease, or a portion of it, will probably have been split in two by the first incision, in which case a strip of bowel must be removed on either side; or again, if it be on the anterior wall, an incision will have to be made on either side of it.

Any attempt to draw down the cut edge of the bowel and stitch it to the anal margin is perfectly useless. The stitches are sure to give way, and before they do so prevent a free discharge from the wound, by forming spaces in which matter may collect and decompose. Anything that can in the least impede the discharge and cause its collection is a source of danger.

**High Trans-Sacral Operation.**—If the growth is high up it may not be accessible without removing a portion of the sacrum. The class of case in which such an operation is necessary has already been discussed.



**FIG. 7.**



**POSITION IN TRANS-SACRAL OPERATION.**

*To face page 139.*

The accompanying diagram shows the position. The patient lying on the belly with the legs lying over the table, an incision is made in the middle line from the last four inches of the sacrum to the coccyx, in many cases to the posterior anal margin. This incision goes right down to the bone. The soft parts are raised in mass on either side, in two thick flaps extending well free of the margins of the sacrum. In this detachment the operator need not bother about the periosteum. He simply uses his knife, held firmly and at an angle, and cuts the tissues away from the bone. The lateral attachments of the soft parts and the ligaments being separated along the lower border of the sacrum on either side by a careful dissection, the sacrum is sawn across at a height of two to three inches, and removed. By care, and not cutting too high, the sacral plexus is safe.

An excellent view is obtained of the lower five or six inches of the rectum, which can be thus removed by a comparatively easy operation. Of course, the plan admits of many modifications. I have, on three or four occasions, succeeded in excising a portion of the bowel including the disease, leaving the lower three or four inches intact, and then made an anastomosis of the cut ends. I have, however, never succeeded in getting primary union, but, on the other hand, union can be obtained, and the bowel restored, by a secondary operation a year or so later (*see case, page 183*), by which time the upper segment will have prolapsed through the artificial anus at the base of the sacrum, and can be, therefore, joined to the lower segment without any tension.

*After-Treatment.*—After the operation the patient should lie on his side or back. I prefer the former position, as it allows of the part being more easily examined, and any oozing is at once detected. Should the position become irksome, he can be gently turned on his back. There is little pain after the operation, but fifteen drops

of liquor opii sedativus should be given for a couple of nights to keep the bowels confined. After the third day the discharge becomes considerable.

Twenty-four hours after the operation I change the outside pad of cotton wool, but do not disturb the plugging till twenty-four hours later. This will now come away by gentle manipulation without risk of starting bleeding. After the plugging has once been removed it need not be replaced.

In doing these dressings the patient must be drawn gently to the edge of the bed, so that the buttocks project well free of the mattress. A square yard of mackintosh sheeting covered by a clean towel is folded over for a few inches at one edge, and passed well under the patient's buttocks, the opposite free edge of the towel and sheeting falling down to a china receptacle on the floor; in this way a dressing can be done without any wetting of the bed. The T bandage and dressings being removed, the surgeon stands behind the patient with his face towards the feet. Nurse holds a kidney bowl beneath the buttocks with the one hand, and with the other a bowl of hot water convenient to the surgeon, who allows a little water to trickle from a clean sponge over the part, while he gently but thoroughly soaps all over the wound, making a good lather. After washing this off with water, the wound is thoroughly syringed out with a weak biniodide lotion. This dressing should be done night and morning, and the part again covered by a cotton wool pad to protect it and absorb the discharge, the pad being kept in position by a T bandage.

All fluids and secretions are prone very quickly to decompose in this neighbourhood, and the proximity of the peritoneum, and the free supply of absorbents in this part of the body, render the absorption of putrid material peculiarly dangerous.

After a fortnight the wound should be carefully examined every third day for early signs of contraction.

This will inevitably come on sooner or later during the healing process. If neglected it will lead to an intractable stricture, while, if properly treated, it causes but little trouble. The stricture is prevented by using a full-sized bougie during the latter stages of the healing process. I have never found it necessary to commence its use till after a fortnight, and often not until the fourth week. It should then be passed every day, and left in as long as the patient can bear it without much discomfort, generally speaking for an hour a day. If this procedure be adopted, it will be found that, by the time the wound is completely healed at the end of a couple of months, there is no stricture. As a precautionary measure, the patients should for at least a year pass a conical bougie for themselves on alternate evenings. This should be merely passed just in and out, and should not be retained.

The cut end of the bowel quickly forms attachments to the sides of the cavity that remain as the result of the operation, and seems during the process of cicatrization to be drawn considerably downwards, so that if three inches of the bowel have been removed, and the parts are examined six months later, it will not be found that the gut terminates three inches above the external orifice, but at a distance of about one inch from it, and that the lining of the canal for the remainder of the distance is composed of a tissue similar to the ordinary scar tissue found on cutaneous surfaces, but of a softer consistency. This tissue has sometimes a great tendency to contract, thus narrowing considerably the outlet. If, however, the whole circumference of the bowel has not been removed, and a strip of the normal mucous membrane, however narrow, has been left, extending to the anal margin, the tendency to contract is greatly diminished; and for this reason, when the disease affects only a portion of the bowel, it may be well not to remove the whole circumference. For the first ten weeks there is little or no

control over the motions, but this gradually returns as the wound soundly heals.

**Removal of Rectal Cancer by Abdominal Section.**

—When cancer is situated not more than five inches up the bowel, it can best be removed by the trans-sacral operation, but beyond this distance, unless very movable, it cannot be satisfactorily reached. The question arises whether, under these circumstances, it can be dealt with by abdominal section. Provided the bowel is fairly movable, and the growth confined to its walls, this is possible—at least, it is so if the growth is close to the sigmoid. It is more a question of room for manipulation than anything else. Everyone accustomed to intrapelvic operations knows the difficulty of manipulations deep down at the base of the broad ligaments, but, nevertheless, it might be quite feasible to remove a growth in this situation. The Tredelenburg position greatly facilitates all pelvic operations. I have on two occasions removed a section of bowel for cancer, including the last inch of the sigmoid and the upper two inches of the rectum, both at St. Bartholomew's Hospital, and since the cases are of interest they will be given at some length. For the following notes I am indebted to Mr. J. A. Briggs, my late House Surgeon.

“D. A., aged fifty-nine, admitted into St. Bartholomew's May, 1897. He had no trouble of any kind till a month ago, except that the bowels were open irregularly, and with difficulty during the previous year. A month ago he had sudden pain in the abdomen attended by some vomiting and slight diarrhoea. Since that time the bowels have never been properly opened, there only being a slight slimy discharge.

“On admission the abdomen was greatly distended and tympanitic. Vomiting had become frequent, and he was obviously suffering from complete obstruction.

“On examining from rectum just as high as the tip of the finger could reach, a hard mass could be felt through

the walls of the bowel. The mass appeared to be in the pelvic pouch of peritoneum. It could be pushed up, and apparently was not very fixed. May 5.—Left inguinal colotomy performed. The large intestine was enormously distended to within an inch of the junction of the sigmoid with the rectum. At this point was a tumour in the bowel about the size and shape of a hen's egg. The bowel at the seat of disease still had a short mesentery, and could be moved easily from side to side. The distended sigmoid was drawn into the wound, stitched to the peritoneum and skin and opened. An enormous amount of fluid fæces escaped, to the great relief of the patient. Eleven days after the colotomy the patient, being in good condition, and the abdominal distension completely relieved, Mr. Cripps reopened the wound, detached the bowel, the opening in which was closed by pressure forceps. The wound was enlarged to five inches. Pads being carefully packed round to protect the abdominal cavity, the sigmoid had an elastic band passed round it, just free of the colotomy opening: it was then cut across. About six inches of bowel, including four and a half inches of sigmoid and one and a half of rectum, were dissected out. This sigmoid included the cancerous mass and the colotomy opening. The cut end of the sigmoid was brought down to the cut end of the rectum, and the two joined by an end-to-end anastomosis. On the third day the patient passed flatus per anum. On the sixth day fæcal matter could be felt in the rectum. On the seventh day a teaspoonful of castor-oil and a very gentle wash out produced a good motion, and the patient subsequently made an uninterrupted recovery. He was still alive and well one year later."

The following case was sent to me by Major Robert Bird, I.M.S., Bengal. The patient, Dr. — was seized with abdominal obstruction in May 1903. A colotomy was performed in Calcutta. At the time of operation



a mass could be felt in the upper part of the rectum. The patient was too ill at the time to justify anything but a simple colotomy above the obstruction. The patient came over to England, and placed himself under my care in July, and was extremely anxious that some attempt should be made to remove the growth. The abdomen was reopened at St. Bartholomew's Hospital in the line of the old colotomy scar, partly detaching the adherent bowel by a five-inch incision. This part of the operation was difficult owing to extensive adhesions. A mass the size of an orange could be felt surrounding the rectum just below the brim of the pelvis. It was quite movable from side to side, but could not be drawn up. There was thirteen inches of bowel between the colotomy opening and upper border of the growth. The bowel was cut across two inches below the colotomy opening. It had been too much damaged in the first part of the operation to save with a view to an anastomosis. The mesentery was seized portion by portion with pressure forceps, transfixed, tied and cut through. The rectum was eventually cut across one inch below the growth. Owing to the depth down in the pelvis the upper cut end of the rectum could not be closed by uniting its peritoneal coats, but was simply transfixed, and tied with three ligatures. The lower end of the sigmoid was then fixed in the old colotomy opening, and the rest of the wound closed. The patient suffered extremely from shock, the pulse rising to 160 on the third day, when for over twelve hours no pulse at all could be counted at the wrist, and the patient was considered moribund. However, he rallied in a marvellous way on the fourth day, and eventually completely recovered, and two years later was reported as still well, and doing his duties in India. The operation was one of extreme difficulty.

## CHAPTER VII

### RECTAL CANCER—TREATMENT BY COLOTOMY

COLOTOMY must not be considered in any way as a rival operation to that of excision in cases of rectal cancer. In a large number of instances excision is quite impracticable, and it is in such cases that the question of colotomy arises. The history of inguinal colotomy commences in a suggestion by Littré a hundred and ninety years ago, in the "Memoirs of the Academy of Sciences" of Paris. He merely discusses the advisability of opening the sigmoid flexure by an operation through the abdominal walls as a means of relieving infants born with an imperforate bowel. It would not seem, however, that he ever had an opportunity of carrying out his own suggestion, and the idea slept for over sixty years when Pillore, of Rouen, performed the operation by opening the cæcum on the right side. The accounts of subsequent operations through a long series of years are very meagre.

At the end of the eighteenth century Callisen proposed opening the descending colon by the extra-peritoneal method, but his failure to reach the bowel on the dead subject by this means discouraged further trial. His scheme was subsequently taken up by Amussat, who sixty-five years ago, by successfully performing the operation, first established lumbar colotomy as one of the resources of practical surgery. From that time till recently colotomy was almost invariably performed in the lumbar region.

Some eighteen years ago a revolution set in as regards

this operation, the inguinal method being adopted in England. This alteration was greatly due to the writings of Herbert Allingham and Reeves, and I think I may fairly claim that my papers,\* published in the *British Medical Journal* in 1888 and 1889, giving an account of thirty-seven consecutive cases, in some measure helped to set the operation on its proper footing.

The chief advantages of the operation are as follows :—First, it is an absolute security against death from obstruction with all its horrors. Secondly, it affords relief to some of the most troublesome symptoms. Lastly, it retards to some extent the rate of growth of the disease.

**Security against Obstruction.**—If left to itself, the termination of a case of rectal cancer is very frequently from complete obstruction. Between the time that the stricture becomes first noticeable and its complete occlusion may be a matter of weeks, months, or a year or more. During the whole of this period the patient's mind is in a constant state of anxiety. He feels instinctively what is impending, and is in daily fear of fatal obstruction occurring. With the knowledge that after colotomy he has an effective safety valve, and it is no matter if the rectum does close, comes great mental relief. So far as this point is concerned, patients often ask if the operation may not be delayed till actual obstruction occurs. The answer to this lies in the fact that the operation when done prior to complete occlusion is a comparatively safe one, with a mortality of only four or five per cent. (*see Table J*),† while if done after complete obstruction the risk is enormously increased, rising as high as fifty-five per cent.

**Relief of Symptoms.**—The pain caused by the growth varies greatly, and is more influenced by the position than by any other factor. When the growth

\* "Inguinal versus Lumbar Colotomy, with a record of thirty-seven consecutive cases," by Harrison Cripps, *Brit. Med. Journ.*, April 6, 1889.

† Page 251.

is near the anal margin the pain is often intense, whereas, when higher up the bowel, there is comparative immunity. Sooner or later the bowel becomes strictured, the symptoms of which are very characteristic, and cause the greatest misery. The sufferer is troubled with constant calls to the closet, and generally believes that he is suffering from diarrhoea, and not infrequently has been told that his disease is chronic dysentery.

What is passed at such times is not a true motion, but rather a grumous mucoid discharge, stained with blood and faecal colouring matter. This discharge arises from an accumulation of scybalous masses in the dilated bowel above the stricture, and what comes away is merely the overflow from this mass mixed with blood and mucus. As time advances the trouble increases, the anus becomes raw and excoriated, and the patient is perpetually tormented with tenesmus. Purgatives and enemata gradually become useless, and the whole attention is fixed upon getting a proper evacuation. The abdomen becomes swollen and tympanitic, and the patient dies with faecal vomiting, or occasionally suddenly from perforation of the intestine (Cases 146 and 213.)

Colotomy completely relieves all symptoms arising from a contracted condition of the bowel. The patient is no longer constantly worried by the passage of mucous stools, but instead has generally one good action daily through the colotomy wound. A mass of decomposing faeces is no longer collected above the narrow part, and his freedom from chronic poisoning from this cause is seen at once by an improvement in spirits, restoration of appetite, and often increase of weight.

**Its Influence in Retarding the Growth.**—For many years my impression was a strong one that the progress of the growth became slower after the bowel was set at rest by colotomy. This view was consistent with the well-known physiological law that disuse of a part is followed by a diminished blood supply and atrophy.

What was formerly a mere impression can now be shown to be a fact, for with accumulated experience I have collected sufficient evidence to show that colotomy adds materially to the length as well as the comfort of life.

In Tables H and I will be seen the relative expectancy of life in cases where no operation has been undertaken, and those in which colotomy has been performed.

It will be seen how the large majority of the unoperated-upon cases died within a year of their first consulting me, the average length of life being only 7.8 months.

While the cases in which colotomy had been performed lived an average of twenty-two months, one of these patients (Case 259) lived eight years and three months after colotomy, dying at the age of eighty-three.

This patient was a single lady, aged seventy-two, under the care of Dr. Fuller, of Curzon Street, London. She had symptoms for eighteen months. There was a mass of cancer four inches from the anus. I performed colotomy on March 1, 1898. On May 24, 1906, Dr. Fuller very kindly wrote to me as follows:—"Miss S., for the last two days, passed very little motion, gradually became unconscious, and died this evening. I should think the case a record for duration of life after colotomy for malignant disease." So far as my personal experience goes it is a record.

The operation of colotomy, although it has advanced in professional estimation, has done so but slowly. It has never been popular, and has generally been reserved for cases of complete obstruction. It has been supposed by some to be a procedure so fraught with danger as only to be justifiable as a last resource, and taking into consideration that it is demanded for malignant disease, it has been argued that the risks are greater than the prospective advantages justify. Others disparage this operation on the supposition that it leaves the patient in a miserable condition, with fæces constantly running away from the opening. These adverse views must be

founded on a misconception of the operation by those who have had but limited opportunities of observation.

The question of colotomy will be further considered under the following headings :—

- (1) Risk to life involved.
- (2) Condition of the patient after operation.
- (3) Method of operating.

**Risk to Life Involved.**—Colotomy, when performed before there are signs of complete obstruction, is an operation of expediency rather than of necessity. The immediate risk to life, therefore, requires careful consideration.

The following figures throw some light on the subject :

#### TREVES

(This author in his classical work quotes Erckeleus statistics.)

Date	Recovered	Died	Total	Percentage of Deaths
1884 . . . . .	68 ..	42 ..	110 ..	38

#### ST. BARTHOLOMEW'S HOSPITAL

1869 to 1879 (Lumbar) . . .	14 ..	32 ..	46 ..	76.1
1879 to 1889 (Lumbar) . . .	26 ..	22 ..	48 ..	45.9
1889 to 1905 (Inguinal) . . .	269 ..	95 ..	364 ..	20.6

#### HARRISON CRIPPS (PRIVATE OPERATION). See TABLE J.

1885 to 1905 . . . . .	127 ..	16 ..	143 ..	11.18
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The foregoing include all cases of colotomy, whether undertaken as a palliative for rectal cancer, or whether done for complete intestinal obstruction. By far the larger number of deaths occurred after colotomy for complete obstruction. This did not mean that the operation was the cause of death, but merely that it failed to save the life of a dying patient.

The question here being discussed is not the operation on patients dying from complete obstruction, but its performance as a palliative treatment for rectal cancer to prevent the patient ever having obstruction.

To show the death-rate of colotomy when undertaken as a palliative, the following figures abstracted from

## 150 RECTAL CANCER—TREATMENT BY COLOTOMY

Table J may be taken. Altogether I have operated on over three hundred cases by colotomy, but for reasons mentioned the table of my private cases only is given.

	Recovered	Died	Total	Percentage of Deaths
For complete obstruction . . .	9	11	20	55.0
Before complete obstruction . . .	118	5	123	4.06

The contrast of these figures is very marked, and shows that when the symptoms of complete obstruction with fæcal vomiting have set in, colotomy will save scarcely half the cases; whereas when performed prior to this, the mortality may only amount to 4.06 per cent. when performed by those experienced in abdominal surgery and in proper hygienic surroundings.

In the eleven fatal cases of complete obstruction, fæcal vomiting was present in all, with the usual swollen and tympanitic abdomen. The condition of the patients at the date of operating will be seen set forth in Table K.

The causes of death in the five cases out of 118 when the operation was performed before obstruction were as follows :—

Case 64.—A man, aged seventy-one, died on the eighth day. The patient gradually sank. There was no post-mortem, and there were no symptoms during life of peritonitis.

Case 75.—A lady, aged fifty-five. The patient very fat, and the greatest difficulty was experienced in uniting the bowel to the skin. The stitches gave way on the sixth day, and she died of peritonitis.

Case 191.—A lady, aged sixty-four. There was practically no mesentery, and there was considerable tension on the bowel when stitched. The stitches gave way on the fifth day, and she died a few days later with peritonitis.

Case 272.—A lady, aged sixty-four. Constant vomiting commenced soon after the operation, and she died on the sixth day. Dr. Roche made a post-mortem, and found a piece of small intestine caught down in Douglas's pouch. It was acutely kinked, and it required some force to

pull it out. It was obviously the cause of the vomiting. There was no peritonitis.

Case 330.—A lady, aged fifty. An excision had been performed eight months previously. The disease recurred, and a colotomy was performed. The bowel was opened on the sixth day. There was considerable bleeding at the time from a vessel in the lower angle. Sudden and very violent secondary hæmorrhage occurred four days later, and much blood was lost before effective assistance could be obtained. The patient never rallied from the bleeding. She was in a weak condition before the operation.

**Condition of Patient after Colotomy.**—The return of strength and gain of flesh is generally well marked after colotomy. This, no doubt, is partly due to the relief from pain, and the quiet nights following the operation, but I think is chiefly due to the patient being no longer in a condition of chronic poisoning from the masses of decomposing fæces above the stricture, for so soon as the bowel is permanently relieved of them, the appetite seems to return, and with it general improvement both in mind and body.

To suppose that a patient after colotomy is in a miserable condition, with fæces constantly running away from the opening, is a delusion. If, as sometimes occurs, the opening is made too small, or allowed unduly to contract, the advantage of the operation is in great measure lost, and constant dribbling occurs from the wound. If, however, care be taken to make the opening valvular and of sufficient size, a motion generally passes but once a day, and there is a fair amount of control over the new anus.

After the operation the amount of discharge from the rectum immediately becomes diminished, and soon loses its feculent character. If, however, the disease be far advanced, there will still be some purulent discharge from the anus, or more commonly from the lower colotomy opening. If after a fortnight or so there is an evil-smell-



ing, dark, gritty discharge from the lower opening, it is a certain sign that some hard, black, scybalous faecal lumps have collected between the lower opening and the stricture. The removal of them is followed at once by relief. These can be removed by careful syringing and using an oblong scoop made for the purpose, or a narrow lithotomy scoop will serve the purpose. It often takes weeks to get completely rid of these lumps. One or two will each day be found to have regurgitated close to the lower opening, and can be felt with the finger, and removed with the scoop. This manipulation causes peristaltic action of the bowel, and the remaining lumps are driven down far out of reach for the rest of the day, but the next morning one or two more will be found to have come back within reach. Sometimes I have removed thirty or forty of these scybala before the bowel has been eventually cleared.

If later in the case the discharge from the growth itself becomes troublesome by collecting above the stricture, and escaping by the colotomy opening, great relief can be obtained by syringing out the lower opening by means of an india-rubber tube passed gently down from the lower opening. Sometimes, although fluid cannot be washed through from the lower opening to the anus, a stream can be passed in the other direction from the anus to the lower opening. If this can be done it is very effective. A dilute boracic lotion answers well.

The length of time the patients will live after the operation, and the extent to which they will be able to get about, is difficult to forecast, and will in a great measure depend upon the rapidity with which the disease advances. One patient upon whom I operated was able for at least two years to go daily to the City and remain there from ten till five without inconvenience. Another patient, a keen sportsman, two seasons after the operation, was able to do a good day's salmon fishing, wading up to his middle some hours a day. Another patient

(Case 264) lived in fair comfort over eight years. As a rule, however, the patients must be prepared to be satisfied with moderate exercise, but on no account should they be encouraged to stay in bed. It is not the inconvenience of the opening that prevents their getting about, but the disease, for it must be remembered that the malignant disease is still present, and, slowly advancing, undermines the patients' strength, so that, perhaps, a year after the operation they will complain that they feel no better than before its performance. But here, of course, it is not right to compare their condition with what it was a year ago, but rather with what it would have been had no operation been undertaken.

When colotomy is done for simple stricture, the patient soon learns in a marvellous way to manage the opening, and is quite able to take his place in social life.

The additional length of life afforded by colotomy is well seen in Table I. It gives an average of nearly two years after the operation. Some patients live, and in fair comfort too, much longer than this. Case 264.—Dr. Fuller's patient lived more than eight years after I had operated.

With many opportunities of watching cases in which colotomy had been performed, and others where Nature had been allowed to run her course, I have no hesitation in saying that the relief obtained and the suffering avoided are unmistakable, and leave me in no doubt as to the great benefit of the operation.

**Time when the Operation should be Performed.—**

This is a question of some importance. If the disease is causing no trouble, and by only invading a portion of the bowel has not produced any appreciable narrowing, it may be well to wait. On the other hand, should there be any signs of commencing stricture, the operation should be performed without delay. If deferred, not only does the patient lose the advantage of the operation, but it may have eventually to be performed for complete

obstruction under the most dangerous and unfavourable circumstances.

Case 146 shows how the bowel may burst from delay. The patient had noticed symptoms for nine months. Examination under an anæsthetic showed a malignant stricture five inches from the anus. A colotomy was advised, but refused. Five weeks later I was sent for to the patient, who was suffering from complete obstruction. There was fæcal vomiting, with enormous distension. On opening the abdomen for colotomy the peritoneal cavity was full of fetid gas, and the colon enormously distended. The actual hole where the intestine had given way could not be found. On opening the sigmoid several quarts of fluid fæcal matter were let out. The patient rallied for a few days, but gradually sank, dying on the sixth day.

**Method of Operating.**—The surgeon has his choice of two sites for opening the colon, the one posteriorly in the lumbar region, the other in the inguinal. I have had considerable experience of both methods, and have no hesitation in saying that the abdominal operation in front is vastly superior to the lumbar. Indeed, it is twenty years since I performed the latter.

The following appear to be some of the chief objections to lumbar colotomy:—

First, the space in which the operator has to work, between the lower border of the last rib and the crest of the ilium, is often extremely confined, so that he is, to a great extent, at the mercy of the anatomical accuracy of the course of the bowel, and even a slight deviation involves a difficult operation. Thus, in the search, the subperitoneal fat becomes extensively bruised, and not infrequently the peritoneum inadvertently, or even unknowingly, opened. To this cause many of the deaths from lumbar colotomy are attributable.

Secondly, it is not always easy to identify the bowel in the limited space. The longitudinal bands are some-

times impossible to recognise. From this cause numerous instances are recorded of fatal mistakes. I have twice seen the small intestine stitched to the skin and opened. The duodenum has many times been likewise opened, and even the stomach has been a victim to the same mistake.

Thirdly, in a fat or muscular patient, owing to the depth of the bowel, and its want of mobility, there is a difficulty in fixing it to the skin without undue tension.

Fourthly, and certainly what is the gravest objection of all, is that if the colon happens to take an abnormal course, altogether avoiding the lumbar region, as so well described by Mr. Lockwood,\* the attempted operation completely fails. I have been fortunate in not having met with one of these abnormalities, but have been present on three occasions when the most skilful surgeons failed to find the colon, and in which subsequent post-mortem examination proved the bowel to be quite inaccessible from the lumbar wound.

Lastly, the position of the opening behind is inconvenient to the patient for purposes of cleanliness and for the adjustment of pads.

Inguinal colotomy meets all these objections. The space in front is practically unlimited, and thus allows of a thorough exposure of the part by a clean incision without the least damaging of the tissues. There can be no possibility of mistaking the small intestine or other structures for the colon, which from its longitudinal bands clearly marked, its convoluted surface, and its glandulæ epiploicæ, admits of absolute identification. Owing to the mobility of the sigmoid flexure, and the ease with which the skin can be depressed, there is little difficulty in fixing the bowel without undue tension on the stitches.

Abnormalities of the colon do not mean failure of

\* "Abnormality of the Colon a Cause of Unsuccessful Colotomy," by C. B. Lockwood.

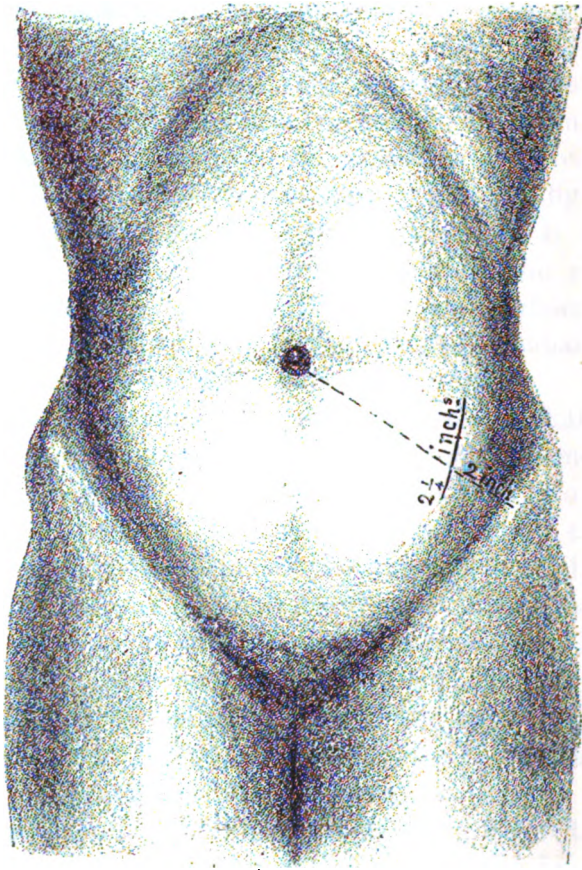
the operation. If the bowel be not in its usual position, it is possible to make a thorough exploration of the abdomen and search for it. I should say that in about five per cent. of cases as seen on the operating table the bowel is not in its normal position. The following is an example of the kind of case in which the bowel is in an abnormal position. On opening the abdomen, I found the small intestine presented, and, on pushing it back, and looking for the colon, it was evident that it was not in its natural position. However, by enlarging the wound, and making a thorough search, it was eventually found passing down the middle line apparently in front of the small intestine. I am confident that it could never have been found by the lumbar incision, and the operation would have been a fiasco.

Besides meeting the chief objections that can be raised to the lumbar operation, the inguinal method has in certain instances an advantage entirely its own. This consists in using the first part of the operation as a means of verifying the diagnosis in obscure cases before the bowel is opened. For instance, an obstruction exists probably high up in the rectum, or there may be a communication between the bowel and the bladder. An examination of the lower part of the rectum has thrown no light as to the site of the lesion. In such a case the surgeon would hesitate at doing a lumbar colotomy, feeling that it might be useless as being below the seat of disease. In inguinal colotomy such a mistake could not occur, for the diagnosis as to the site of obstruction could be made certain before the bowel is actually opened.

Two objections have been especially urged against the inguinal opening ; first, that it affords greater facilities for prolapse of the bowel ; and, secondly, that it is unsuitable for urgent cases. In answering the first of these, it is not my experience that prolapse is more frequent from the one opening than from the other ; moreover, by a little care in drawing down the bowel in the inguinal



**FIG. 8.**



Shows the line of incision adopted by Harrison Cripps for inguinal colotomy.

An imaginary line is taken from the anterior superior spine to the umbilicus; the incision,  $2\frac{1}{2}$  inches long, crosses this at nearly right angles, at two inches from the anterior spine. One-third of the incision is below and two-thirds above the imaginary line.

*To face page 157.*

operation protrusion can to a great extent be guarded against. The second objection could only hold good in a certain number of cases, and I believe even in these the danger is more imaginary than real.

Doubtless it would be more prudent, when possible, after stitching the bowel to the skin, to allow a certain interval to take place before opening it, in order to afford the peritoneum time to become sealed off. If the bowel be distended and vomiting present, there is no time for waiting, for the pressure thus caused would certainly burst the bowel away from the stitches. In these cases I at once open the bowel after accurately stitching it to the skin; the wound is immediately swamped by feculent material. A stream of warm water must be kept constantly pouring over the wound for ten minutes or so till the distended bowel has completely relieved itself.

Having discarded lumbar colotomy for rectal cancer, I shall not describe the steps of an operation which I consider obsolete, but will at once proceed to the inguinal operation.

**Method of performing Inguinal Colotomy.**—The patient has a warm bath the night previous to the operation, the abdomen being thoroughly well cleaned with soap and water, and afterwards covered with a light, antiseptic dressing. This is important, for, since the operation is usually undertaken for cancer of the rectum, the part is liable to become contaminated with the fetid discharge. I make my incision rather higher than most operators. The branches of the epigastric artery are thus avoided, and there is subsequently less pressure on the wound than when lower down. As a guide, I take an imaginary line from the anterior superior spine to the umbilicus; the incision, two inches and a quarter long, crosses this at right angles two inches from the superior spine. Two-thirds of the cut is above and one-third below the imaginary line, as shown in the accompanying sketch (Fig. 8).



## 158 RECTAL CANCER—TREATMENT BY COLOTOMY

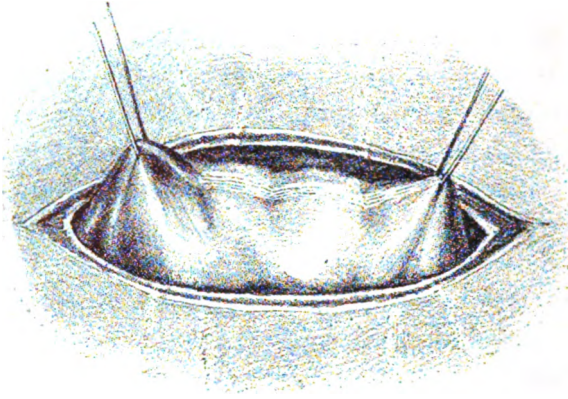
In making the incision the skin should be drawn a little inwards, so as to make the opening somewhat valvular. The peritoneum being reached,\* it is pinched up by fine forceps, and an opening made sufficient to admit the finger. The intestines being protected by the finger, the peritoneum is divided by scissors to nearly the full length of the cutaneous incision. The colon may now at once show itself, and can easily be recognised by its longitudinal bands, its glandulæ epiploicæ, and by its regular convoluted surface. In about a third of my cases the large intestine presented at once; in the others either the small intestine, omentum, or mesentery first appeared. If any of these latter present, they must be pushed back, and the colon sought for by the finger. Sometimes it can be detected by the hard scybalous masses within it, or it can be traced up after passing the finger into the pelvis, and feeling for it as it crosses the brim. Great care should be taken to prevent any of the small intestine from protruding, otherwise a considerable difficulty may be experienced in returning it into the abdominal cavity without a great deal of handling.

The colon being found, a loop of it is drawn into the wound. In order to avoid the prolapse which is likely to occur if loose folds of the sigmoid flexure remain immediately above the opening, I gently draw out as much loose bowel as will readily come. Two provisional ligatures of No. 1 silk are passed through the longitudinal muscular band opposite the mesenteric attachment. These provisional ligatures, the ends of which are left

\* A surgeon of any experience will recognise the peritoneum at once, and inguinal colotomy should only be done by such an operator. The following shows what may happen to the ignorant when they undertake what is beyond them. A surgeon having exposed the peritoneum, was in doubt as to its nature, but considering it to be the bowel, stitched it all round to the skin. On the fourth day great preparations were made for opening the supposed bowel. After a cautious incision, instead of the expected fæces, there popped out a large coil of small intestine!!! It was at this stage that I was requested to see the case, "on account of its rarity"!!!



**FIG. 9.**



**FIG. 10.**

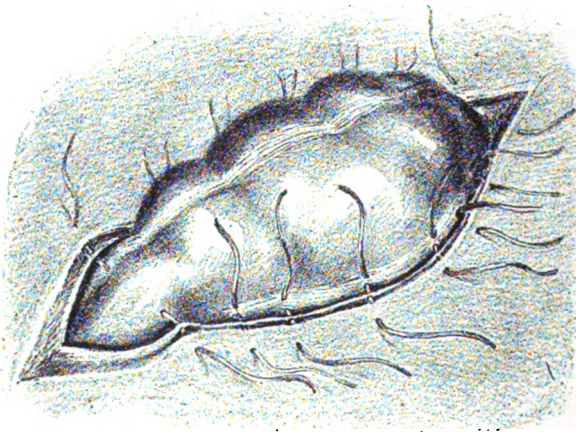


Fig. 9 represents the second stage of the operation for inguinal colotomy. The two silk threads used as guides are seen passed through the external or muscular wall of the bowel.

Fig. 10 shows the position of the bowel when all the sutures have been passed, but not yet tied up. None of the sutures pass deeper than through the muscular coat of the bowel.

*To face page 159.*

long, help to steady the bowel during its subsequent stitching to the skin, and, moreover, are useful as guides when the bowel is ultimately opened. They should be about two inches apart.

The bowel being drawn out, is fixed to the skin and parietal peritoneum by seven or eight fine sutures on each side, the last suture at each angle going across from one side to the other. The bowel should be so attached as to have two-thirds of its circumference external to the sutures. By turning the bowel slightly over, the lower longitudinal band can be clearly seen, and it is best to pass the sutures for the lower side through this, since it is a strong portion of the gut (*see* Fig. 10). The upper longitudinal band through which the provisional ligatures have already been passed is seen in the middle line of the wound. The bowel being now turned downwards, the opposite line of sutures are inserted close to its mesenteric attachment. Indeed, more commonly they have to be passed through the inner layer of mesentery itself. No longitudinal band can here be seen. The sutures, of the finest Chinese silk, No. 00, are passed by small, partly curved needles, the needle passing through the skin one-eighth of an inch from the margin, one-third of an inch apart, then through the parietal layer of the peritoneum, and, lastly, partly through the muscular coat of the bowel, care being taken to avoid perforating the mucous membrane. In passing the upper row of stitches through the mesentery, fair-sized blood vessels are seen running into the bowel at right angles. I pass the needle beneath them, using the blunt (eyed) end so as not to prick the veins. These vessels are strong, and form a good support to the sutures. It is easier to pass all the threads before tying them up.

The wound should be most carefully and gently washed; the threads can then be all tied with moderate tightness. If the case is urgent, the bowel may now

be opened; if not, a piece of gutta-percha protective is put over it, a necessary precaution to prevent the granulations adhering to the gauze. The whole is covered with an antiseptic dressing, an additional thick pad being placed over the site of the wound. A broad flannel, many tailed bandage is then wound firmly around the abdomen, so as to insure considerable pressure. This is a most important precaution, for, should vomiting occur, the bowel is likely to burst away from the stitches. I also insist on the nurse sitting by the patient, with directions to press her hand firmly over the wound should sickness occur. When the patient becomes sensible, he can do this for himself. The wound is best dressed on the following day if there has been vomiting, to make sure that nothing has been misplaced.

If all goes well the dressings may be reapplied, and the bowel not opened till the fifth or sixth day. The bowel being insensitive, no anæsthetic is required. It will usually be found covered with a layer of lymph of surprising thickness. The provisional ligatures which have been left in will be found a useful guide, the bowel being opened to the full length between them. The superfluous flaps on either side are trimmed off with scissors to the level of the skin. In doing this one or two vessels require to be tied.

All ligatures may be safely removed by the ninth day, or earlier if there is redness around them. Firm pressure with a pad and bandage will be required for some time later.

The question as to the date when the bowel should be opened is an important one. In urgent cases, as already mentioned, I should not hesitate to open it at once. On the other hand, if there is no vomiting or constitutional symptoms, it may be advantageously left to the sixth day. The patient, however, requires to be very carefully watched. If the abdomen becomes distended with wind, if pain is felt, or, above all, should

vomiting come on, the bowel should be immediately opened.

The wound varies much in different cases in its way of healing. In no inconsiderable proportion the union takes place between the skin and the bowel by first intention. In other instances, after a few days, the bowel, together with the parietal peritoneum to which it has become adherent, falls away from the skin, and sinks below the level of the muscular parietes.

This want of primary union depends on two causes, the one being due to the stitches being too numerous and too tight, so that the skin is too much strangulated, the other to there being too much tension on the bowel. It is interesting to observe the effect that antiseptic protection has on the effused lymph. This is thrown out in a considerable quantity, and quickly covers the exposed bowel and edges of the wound with a thick layer. So long as this is aseptic there is no sign of redness or inflammation at the line of junction, and in a few days it will have so far developed as to effect a permanent union between the bowel and the skin. On the other hand, when an early opening of the bowel necessitates the abandonment of the antiseptic treatment, the lymph already formed melts away. A red line appears at the margin of the skin, and primary union frequently fails. This inflammation can, however, often be entirely prevented by the wound being carefully washed with soap and water night and morning. The *fæces* themselves seem quite innocuous to the wound. It is only if *fæcal* matter is allowed to accumulate at the wound margin that harm comes, this *fæcal* matter being a ready soil for external germ infection.

Often no motion will pass through the new opening for several days. No anxiety need be caused if wind is passed, for there is no obstruction. I have known as long as ten or twelve days elapse without discomfort before any motion has passed. Should no motion

have appeared by the eighth day after opening the bowel, a teaspoonful of castor-oil should be given, and repeated if necessary.

The subsequent inconvenience arising from a colotomy opening varies in different cases. If the opening is too small, or allowed unduly to contract, the advantages of the operation are in a great measure lost, and constant dribbling occurs from the wound. If, however, care be taken to make and maintain the opening of sufficient size, the motion generally passes once a day, and there is a fair amount of control over the new anus.

Different varieties of trusses have been devised for covering the opening, and one made by Messrs. Arnold and Sons is fairly good, but I doubt whether anything answers better than a pad and flannel bandage. A piece of lint three inches square, smeared with simple ointment, should be placed over the opening. Above this a small pad of boracic wool, or one of Gamgee's sponges, may be applied, the whole being covered with a large flat pad of cotton-wool, protected with gutta-percha tissue. The pads may be kept in position by a few turns of a wide flannel bandage, using a perineal strap if necessary.

**Complications during the Operation.—Superfluous Bowel.**—If the principle is adopted, and it is, I think, the right one, of drawing out as much of the sigmoid as will readily come, there will often be a loop of six to twenty-four inches of the large intestine outside the wound. If the loop is only of moderate amount, say, six or seven inches, it can be safely stitched in the usual way, and opened and cut off at a subsequent date. On the other hand, if the amount is very large, say, one to three feet (*see* Cases 180, 197, 222, 256, 267, 291), it is safer, after accurately stitching the base of the loop to the skin, to cut it off at once. If it is left it will be found impracticable to put on a bandage sufficiently tight over the wound to prevent risk of the stitches giving

way if vomiting occurs. In the case of a large loop the opening through the abdominal walls should be longer than usual, being two and a half inches at least. It must be remembered in these cases, that when the loop is drawn out of the wound, half the available space will be occupied by its mesentery. Care must also be taken that the upper segment of the bowel has more space allotted to it than the lower. If this precaution is not taken, it will be found that when cicatrization takes place, the upper opening will be too small. In addition to stitching the two segments of the bowel into each angle of the wound, they will have to be stitched to the corrugated mesentery that lies between them, which in its turn must also have a stitch or two to fix it to the skin.

**Absence of Mesentery.**—I have had some six or seven of these cases. They are rare, representing about two per cent. The bowel lies behind the peritoneum, which passes over it with a mere undulation, having no distinct mesentery. Owing to the want of mobility the bowel cannot be drawn properly up to the skin without great tension. When fixed the stitches give way about the fourth day, and the bowel drops back. Two of my fatal cases (Nos. 79, 191) were due to this cause. The stitches gave way on the fifth and sixth day respectively, and both patients died of peritonitis.

I have now an efficient way of meeting this dangerous complication. It consists in dividing freely the outer parietal layer of the peritoneum after it has crossed the bowel. This at once, to a certain extent, sets the bowel free. It can then be raised after a little dissection, and drawn partly out from its peritoneal investment, and sufficiently loosened to be drawn to the skin, or at least to the cut edge of peritoneum in the abdominal incision, and fixed there without undue tension.

**Difficulty in finding Bowel.**—In about half the cases, on opening the abdominal cavity, a loop of the sigmoid will at once present itself, and can be readily



## 164 RECTAL CANCER—TREATMENT BY COLOTOMY

recognised by its longitudinal bands of muscular fibre. Occasionally these are scarcely marked, being more or less spread out evenly over the surface. Under these circumstances, the sigmoid closely resembles the small intestine. It can, however, be recognised by the glandulæ epiploicæ, and often by hard lumps of scybala inside. If the sigmoid does not present on opening the peritoneum, the small intestine or omentum will do so. After considerable practice, I have learnt "the feel" of the large intestine. It is difficult to describe this, but with a little practice it is possible thus to identify the part wanted, and hook it out with the finger. In the few cases when there was a real difficulty in finding the bowel, it was always lying far out towards the middle line of the belly, and was arrived at by tracing it up from the brim of the pelvis. A surgeon should not attempt to perform colotomy unless he is a sufficiently good anatomist to identify all he may meet with in the abdomen. In one case with which I am familiar, the lower edge of the stomach was mistaken for the sigmoid, stitched, and opened. The small intestine has occasionally been treated in the same way. Nothing should be stitched into the wound unless the operator is absolutely certain of its identity.

### **Difficulty of finding the Bowel owing to Fat.—**

This is another complication that may arise, and occurred in Case 151. Here the obstruction was complete. No motion or wind passed for seven days, and there had been vomiting for twenty-four hours. The patient was a heavy man, of some sixteen or seventeen stone. Assisted by Mr. Eccles, I opened the abdomen, and what appeared to be fatty omentum protruded. This was pushed back. Then small intestine, with an enormously thickened fattened mesentery presented. After a long search, nothing like the large intestine could be detected. A piece of gut was then found, which was thought to be the colon, but it proved to be only small intestine

completely wrapt round in omentum. Ultimately, after half-an-hour's search, a mass of fat was opened in the left iliac fossa. At the bottom of this the bowel was at last found. The mass of fat in which it was discovered was four inches thick, and appeared to be completely behind the parietal peritoneum, which had to be opened to expose it. The patient died.

**The protruding Coil distended with Fæces.—**

Sometimes the loop, especially if of any size, may be distended with fæces. This can generally be kneaded gently out of the loop. If this cannot be done, and it is not wished to cut off the superfluous bowel till the advantage of a few days for adhesions to form has been given, the proceeding adopted in Case 197 is efficient. Here a large coil of sigmoid protruded. This was tightly distended with semi-solid fæces. A clean incision was made into the gut, and the whole of its contents squeezed out. The cut was then sewn up, and the loop of empty intestine covered over with protective and a gauze dressing. On the sixth day the dressing was removed, and the bowel, which was quite aseptic, was cut off in the usual way.

**Complications after Operation.—Protrusion of Omentum and Small Intestine.—**Unless the stitching has been very accurate, and plenty of pressure put over the wound, a violent attack of vomiting or coughing may cause the stitches to give way in parts, and through the opening the small intestine and omentum may protrude. It is to avoid this accident, which is not uncommon, that I pay so much importance to having firm pressure put on the wound after completing the operation, and the great and insuperable objection to passing a glass rod through the mesentery arises from this reason. With a glass rod beneath, the bowel would be badly damaged by the amount of pressure that I consider essential to make matters safe. If there has been violent vomiting or coughing after the operation, it is always

wise to re-dress the wound the day following the operation to make sure that all is safe.

**Falling back of Bowel.**—This is an accident that may take place any time after the fifth or sixth day, by the stitches cutting out if the operation has not been aseptic. The following cases will illustrate the accident, and indicate the line of treatment.

A lady (Case 59) sent to me by Dr. Hutson, of Barbadoes, had a tight malignant stricture of the rectum. Inguinal colotomy was performed, but there was a little more tension than usual on the stitches. The bowel was opened on the sixth day. The following day, during a fit of coughing, the patient was seized with violent abdominal pain. She quickly became collapsed, and when I saw the patient an hour after the accident, I found her in intense agony, with a pulse scarcely perceptible, extremities cold, and face bathed with clammy sweat. On examining the bowel it was found that during a fit of coughing the entire bowel had torn away, and dropped back into the abdominal cavity. The patient, at the same time, appeared to have had a free action from the open bowel, the whole of which went into the abdomen. With the assistance of Mr. Bruce Clarke, and without an anæsthetic, I slightly dilated the wound, and then thoroughly washed out the abdominal cavity, drawing out the coils of intestine and washing them one by one. The proceeding took some time. The patient, however, almost immediately the washing commenced, stated that she had completely lost her pain. The detached bowel was then again united to the skin. For two or three days the patient's life hung on a thread, the pulse being over 150. On the fourth day, however, she rallied, and from that time made an excellent recovery.

A man of middle age was admitted into St. Bartholomew's Hospital for carcinoma of the rectum. Inguinal colotomy was performed. A glass tube was passed to

keep the bowel up, and only a very few stitches used. The glass tube was withdrawn on the fourth day, and the bowel opened. On the next day, during a fit of coughing, the bowel gave way, and fell back into the abdominal cavity. In the absence of one of my colleagues I saw the case, and found the patient collapsed, and that the bowel had completely disappeared from the abdominal wound, and some semi-fluid fæces oozing out of the aperture. The wound was enlarged, and after some search the detached bowel was found, and again brought to the surface. The abdominal cavity was then well flushed with several gallons of hot water. An opening was made two inches above the pubes, and a drainage tube passed through this into the bottom of the rectovesical pouch. The washing was then continued, and a large quantity of peasoup-looking water returned through the tube. When the water came back quite clear, the sigmoid was again stitched to the wound. The patient recovered.

If at the time of opening the bowel the operator is not quite satisfied with the hold of the stitches, he should by means of a circular needle pass a silk gut suture through the whole thickness of the bowel and abdominal wall on either side of the incision. This makes the wound quite secure. Great care must be exercised in doing this not to disturb the existing sutures.

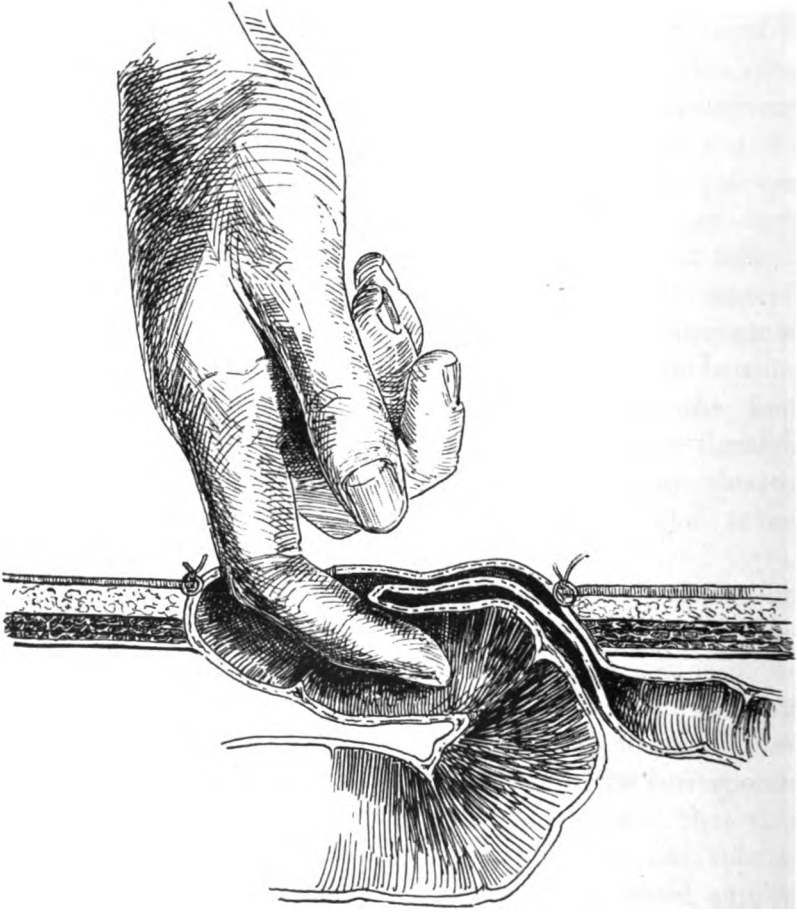
**Acute Intestinal Obstruction following Colotomy.**—I operated on a man at St. Bartholomew's. All went well, and the artificial anus had united firmly, and was working well. The patient was on the eve of leaving the hospital when he was suddenly seized with sharp griping pains referred to the region of the colotomy opening. An hour later he commenced to vomit. The vomiting continued for three or four hours, when the patient felt something slip in his inside. The vomiting ceased, and the pain suddenly left him. The next day, beyond a little tenderness, he was all right, and left the

hospital. Ten days later he was readmitted in a dying condition. He had been vomiting for two days, and was in a state of complete collapse, dying a few hours after readmission. At the post-mortem the colotomy wound was found firmly united, and there was no sign of peritoneal inflammation. A piece of small intestine over a foot in length was found to have slipped down between the attached portion of the gut and the reflection of the parietal peritoneum in the neighbourhood of the anterior superior spine. The canal thus formed was an inch in length, bounded on one side by the attached bowel, and on the other by the reflected fold of peritoneum. The canal would just admit one finger, and through it had slipped a loop of small intestine which had become strangulated. There can be no doubt that the first attack was due to the small intestine slipping through this canal, from which it afterwards spontaneously released itself. Prompt abdominal section would have saved the patient.

**Recurrent Hæmorrhage.**—This is not uncommon after inguinal colotomy, and occurs, I should say, more or less in about seven per cent. of the cases. It is liable to follow those cases in which a considerable loop of bowel has been cut off. It must be remembered that when a loop is drawn up into the wound, the corresponding mesentery has been drawn up with it, and that this folded up and compressed mesentery is a regular sponge of vessels, for through it comes the whole blood supply of the bowel. In cutting off such a loop of bowel with its mesentery it should be done in small segments, each bit being first grasped with pressure forceps and then transfixed and tied. In an extensive case fifteen to twenty separate ligatures may be required. The vessels, if thus carefully tied, will probably be all right, but notwithstanding every precaution recurrent bleeding will occasionally take place, and this usually from the lower angle of the wound. It may occur any time within the



**FIG. 11.**



**Illustrating a possible danger in opening the bowel in a case of colotomy.**

*To face page 169.*

first three days after opening the bowel; I have not known it later. It is dangerous, often violent and difficult to get at. It was the cause of death in Case 330.

**A Danger in Opening the Bowel.**—A patient, aged sixty, had colotomy performed. The following day her abdomen was much distended. I therefore decided to make a small opening to give relief to the wind. This was done, a large quantity of gas escaping. Two days later I proceeded to enlarge the wound. In doing this the little opening previously made was enlarged so as to admit the finger, and so make a guide for the scissors. In enlarging the opening I nearly made a serious mistake. I had passed my finger into the bowel, and with one blade of the scissors in the bowel and the other outside, was about to prolong the opening, when it struck me that the bowel seemed thicker than usual, so that instead of using the scissors I cut down cautiously with a knife on to my finger, which I thought was inserted into the bowel opening; I then found that my finger had really passed into the lower opening of the bowel, and this portion of the loop doubled backwards beneath the upper part (*see* Fig. 34), or in other words, that my finger had passed round the spur. Had I cut this with the scissors, both layers of the bowel would have been divided, and, consequently, the peritoneal cavity opened.



## CHAPTER VIII

### PALLIATIVE TREATMENT

**Refused Treatment.**—In fifty-five cases operative treatment was advised, but refused. Some few of them were operated upon by some surgeon other than myself. The majority of them, however, refused all operative treatment, though many were suitable for excision, and others might have been much relieved by colotomy. Speaking generally, the percentage of cases that refused operation was larger at an earlier period than at the present time. Twenty years ago there still existed much prejudice against operating for cancer both in the minds of patients and many of the older practitioners—prejudice which improved methods and better results have in great measure now removed. As regards colotomy, too, the inguinal operation, having almost entirely superseded the lumbar, has rendered the operation far less dangerous and more reliable, and although there still exists some dislike to the operation, it is much less than formerly.

**Palliative Treatment.**—In ninety-seven cases out of 380, or in 25 per cent. of the cases, for one reason or another no operation was advised. If excision be impracticable, and a colotomy unadvisable or declined, something may yet be done to relieve the patient's condition. The diet requires careful attention, and should be of a nourishing description, and taken as far as possible in a concentrated form in order to diminish the amount of fæcal material. If the bowel be very irritable, I have seen much temporary benefit follow a pure milk diet. Mutton

and chicken-broth generally agree better with the patient than beef-tea, while Valentine's meat-juice, well diluted, may be employed with advantage.

So far as medicines are concerned, I know of none that have the slightest direct effect upon cancer.

Chian turpentine I have given a thorough trial, but am sorry to say that in my hands it has not proved of the slightest service. If it agrees with the patient, a dessert-spoonful of cod-liver oil three times daily I have fancied retards the emaciation, while it certainly renders the motions easier. With patients who cannot take the oil, some light mineral acid tonic may be prescribed, such as the nitro-hydrochloric acid ( $\pi x$ ) with a little tincture and syrup of orange-peel twice daily.

Purgative medicines must be avoided, for they may set up a violent diarrhoea difficult to control; while if administered for symptoms of obstruction they are positively dangerous. I have seen at least one death after colotomy which was chiefly due to violent purging setting in after operation, caused by the large doses of medicine previously administered.

There is no objection to the patient taking, if necessary, some mild laxative, such as a small quantity of Friedrichs-halle water, or a small dose of liquorice powder; but the constipation is most commonly mechanical, and due to a difficulty in passing motions through a narrow gut, and should therefore be treated by careful oil-and-water injections.

Wind, often a troublesome symptom, may be relieved by charcoal or by bismuth and turpentine. Of the former, a teaspoonful spread on bread-and-butter may be tried two or three times a day; while the latter may be prescribed thus:

Olei terebinthinæ,  $\pi xv$   
Liq. bismuthi,  $\Im ss$   
Mucilag. acaciæ,  $\Im ij$   
Aquæ carui,  $\Im j$

two or three times daily.

If the nights are restless, a single dose of opium, varying from ten to twenty drops of liquor opii sedativus, is valuable, but I have the greatest dislike to the frequent administration of opium both day and night in increasing doses. The craving for the drug becomes such that the patient will magnify his sufferings to any extent in order to obtain a frequent dose.

The mental depression and utter demoralisation thus produced causes far more misery to the patient and distress to the friends than the physical suffering it is supposed to relieve. Employed in an indiscriminate manner, I consider opium as one of the greatest curses to which suffering humanity can be subjected.

Patients in a position to do so should be encouraged to take a fair amount of exercise, unless they notice that such a course clearly aggravates the symptoms. The venous circulation being so much assisted by movement in the surrounding parts probably explains why pain and discomfort is often less after a day of moderate exercise than one in which the patient has lain completely at rest. If, however, the disease implicates or protrudes from the anus, exercise can scarcely be borne from the irritation it produces.

**Local Treatment.**—This is important. The parts must be kept scrupulously clean, great care being taken to prevent the collection of acrid discharges about the anus. The part should be frequently washed with soap and water, and thoroughly dried with a soft towel.

If there be any fungoid projections, they can be kept dry and comparatively sweet by being dusted over with boracic acid powder. A small pad of absorbent cotton-wool kept in position by a T bandage prevents the linen from being soiled.

The diarrhœa and tenesmus, so troublesome a symptom in the later stages, are often due to the retention of fæcal material above the disease, its presence producing conges-

tion and irritability of the ulcerated part. In these cases great comfort and relief follows the use of a good oil-and-water enema every night; it clears the bowel above the disease, and thus removes a potent source of irritation. To be of use this must be done very thoroughly. I often find, unless special instructions be given, that the injection is merely passed into the anus, dilating the rectum below the disease without removing the matter above. To be effective, a Higginson syringe should be attached to the half of a No. 12 soft catheter, with an eye near the point. The catheter should then be gently passed up the bowel beyond the disease. After the bowel has been cleaned in this way, an injection to be retained of an ounce of warm thin starch, to which ten drops of liquor opii sedativus have been added, is very soothing. This must be injected through a soft catheter by a little india-rubber syringe made to hold the necessary amount.

**Linear Proctotomy and Scraping Away the Growth.**—It was suggested by Kelsey in one of his able papers\* that instead of colotomy a free posterior proctotomy, so as to divide the strictured bowel, might be performed. In rare cases, when the obstruction is close to the anus, the operation might be right, and in the single case† in which I have seen it performed, some temporary benefit followed. But should the disease be at the usual height the difficulty of dealing with any hæmorrhage from the rotten tissue would be an element of considerable danger, while the relief could only be but temporary.

Sometimes, when the disease recurs, it very rapidly forms a large cauliflower mass about the anus, giving rise to a putrid discharge, and great difficulty in keeping the patient sweet and clean. In several of these cases great

\* *New York Med. Journ.*, June 1880.

† *Lucas Ward Register* vol. viii. p. 300.

benefit has followed through the thorough scraping away all the soft sprouting material with a Volkmann's spoon. If this be done rapidly, and quite down to the hard base, although the hæmorrhage is pretty free, it can be quickly controlled by direct pressure.

## CHAPTER IX

### SELECTED ILLUSTRATIVE CASES OF CANCER

It would be out of the question to record in detail all the cases operated upon. Moreover, in Table A will be found a brief note of most cases of interest. I propose, however, to give the details of a few selected cases so as to draw a more realistic picture of the course of the disease than can be afforded by the abstract symptoms described in an earlier portion of this work.

M. M., aged sixty-one, was kindly sent to me by my friend Mr. Doran. She was very thin and emaciated, and for some time had been unable to follow her occupation as a laundress. For more than a year she had suffered discomfort in the rectum, and had lost blood from time to time, a muco-purulent discharge being persistent. During the last few months the pain had greatly increased, her nights were sleepless, and she was tormented with a constant desire to go to stool. She suffered from alternate attacks of diarrhoea and constipation, and could not retain her fæces when liquid. On examination with the finger, commencing just within the anus and extending upwards a couple of inches, an ulcerated mass of cancer was felt. This did not completely surround the bowel, a small portion of the anterior wall being free. The operation was performed in the manner already described. The patient made a quick recovery, leaving the hospital in five weeks, free from all pain, with some control over her motions, and her general health greatly improved.

She subsequently came to my out-patient room once in every fortnight, on which occasions the bowel was carefully examined. All seemed well for the first three months. She then complained of a slight irritation of the part. Upon examination, at a spot on the strip of the mucous membrane that had been left, the membrane looked rather more vascular than normal, and seemed to be slightly raised above the surrounding level. Incautiously, something was said about a further operation being necessary, and the patient, a nervous woman, ceased to attend for six weeks. She then attended again, frightened by passing blood with her motions. I found at the spot that had previously looked suspicious a beautifully round papillary growth, about the size of a large pea. It projected into the rectal cavity and felt soft, but, when taken between the finger and the thumb, could be felt to have somewhat of a hard base. The little growth, including its base, was seized by a pair of vulsellum forceps, drawn down, and cut off with scissors. The wound healed quickly. The patient remained perfectly well for fourteen months; at that time she felt no pain, but her attention was again drawn to the part by a little blood in her motions. I found that the blood proceeded from a minute speck of red granulation-looking material, certainly not larger than a millet-seed, which projected through a tiny hole in the cicatrix that was left by the second operation. By placing the thumb in the vagina and the forefinger in the rectum, a little tumour, less than a quarter of an inch in diameter, could be distinctly felt in the recto-vaginal septum. The mucous membrane of the vagina was freely movable over the nodule, which was firmly connected with the cicatrix on the rectal surface. This tumour was removed, and the woman called at my house every six months during the next three years. I examined her carefully on each occasion. There was no sign of any further recurrence. She gained flesh, had no pain, and had perfect control over her motions, except when fluid.

The only trouble she complained of was occasionally some prolapse of the bowel. Upon my last seeing the patient about four years after the operation, she was quite well and promised to call and see me if at any time she had further symptoms.

A. G., aged 54, a small emaciated woman, with a dark complexion. She had six children living, in good health, and has lost none. The father and mother died at advanced ages ; there was no family history of tumours or phthisis. The patient had good health until two years ago, but has always been subject to constipation, for which she has taken castor oil in considerable quantities. Two years ago she began to suffer from pain and a feeling of weight in the rectum. Eighteen months ago she first noticed a discharge of blood and mucus from the bowel. During the past year she had lost flesh rapidly, having formerly been very stout. She had been for some months in a London hospital, but obtained no relief. Her sufferings were very great ; she had lost control over the sphincter, the fæces escaping without her knowledge. Upon examination, the parts were found to be very tender, with a growth extending almost to the margin of the anus, about which the skin was oedematous and excoriated. A considerable mass of disease occupied the lower three inches of the bowel, taking the form of a large irregular ulceration with a hard base and fungating margins. At one point the disease extended somewhat higher than three inches. The recto-vaginal septum was implicated, but the mucous membrane on the vaginal aspect appeared sound.

Considering the length of time that the disease had existed, and the extent to which it had encroached on the anterior wall of the rectum, it did not seem a very favourable case for operation. The patient, however, was exceedingly anxious to have an attempt made to remove it, having been recommended to consult me for that purpose by my friend Mr. Macready. The operation was



performed in the usual manner. There was no difficulty in detaching the bowel from its posterior and lateral connections, but it required some time and caution to dissect through the recto-vaginal septum; this was done by keeping as near as possible to the mucous lining of the vagina; but even at the time there appeared a suspicion that the disease at this part had not been thoroughly removed. Whilst detaching the upper anterior part of the rectum, the peritoneal membrane was distinctly seen. The diseased bowel being brought down, was cut off a little more than three inches from the anus. Upon detaching the portion, a small coil of intestine was seen in the upper part of the wound, but it was not known at what period of the operation the peritoneal membrane had been opened. The knuckle of bowel was gently pressed up by the finger, and disappeared. The wound was treated in the ordinary way, without any dressing or sutures, and kept thoroughly free from all discharge by frequent syringing with warm carbolic lotion.

The patient never had a symptom of peritonitis, recovered quickly, and left the hospital at the end of the month free from all pain, and much stronger and more comfortable than she had been for a long time; she had no pain on passing her motions, over which she had a fair amount of control. She appeared well and comfortable for three months; she then complained of some irritation about the part, and upon examination a soft fungating nodule could be felt springing from the anterior wall of the rectum. She suffered little pain. A month later the disease had greatly increased, forming a considerable fungoid mass, blocking up the lower end of the rectum, causing some difficulty in passing her motions. It did not seem advisable to make any further attempt by a cutting operation; but, acting as other surgeons have done in these circumstances, as far as I could with the finger-nail and a blunt gouge, I scraped away the cauliflower growth down to its hard base. There was not much

bleeding during this proceeding, and it gave her great relief, and she was enabled to pass her motions with comparative ease. The growth rapidly returned, the patient dying a few months later.

Miss D., a single lady, living partly in London and partly in the country, had always enjoyed good health until towards the end of 1879. She then for the first time noticed a slight amount of blood in the motions, and suffered considerable pain at times. She was treated for some time as suffering from piles, but grew worse, the pain increasing, and there was a profuse discharge of matter. In July 1880 she consulted Dr. Matthews Duncan, who, recognising the nature of her illness, kindly advised her to consult me.

At this time she had lost flesh considerably, and had a sallow complexion. The pain had become much worse lately, and she was tormented with a frequent desire to pass a motion, which generally resulted in some blood-stained discharge. Upon examination, the anus outside appeared normal, but a hardness could be felt in the left ischio-rectal fossa, and pressure on this spot was painful.

By drawing the sides of the anus apart, a small portion of growth could be seen protruding from the bowel on the left side. Upon introducing the finger into the anus, there was found to be a hard mass occupying the left side of the rectum, and apparently filling the ischio-rectal fossa.

On the surface of the tumour, towards the rectum, was a deep crater-like depression; the growth at the margin of the depression was somewhat raised above the mucous membrane. The upper border of the growth was two and a half inches from the anus, and it occupied about one half the circumference of the bowel.

July 28, 1880.—The patient being put in the lithotomy position, and ether being administered by Mr. Mills, with the assistance of Mr. Butlin I performed the following operation: I divided the bowel back to the coccyx, keeping

a little to the right of the middle line. I then made a semicircular incision, just at the junction of the mucous membrane with the skin round the left side, to half an inch beyond the middle line of the anterior surface of the bowel. As usual in these cases, the separation of the bowel and tumour from the ischio-rectal fossa was easily accomplished by the finger assisted by a few snips with the scissors. Careful dissection was required to separate the anterior surface of the bowel from the posterior wall of the vagina. After carrying this dissection well across the middle line, I divided the bowel with scissors by longitudinal incision three inches in length. By this means a portion of the rectum involving two-thirds of its circumference, in which was included the morbid growth, was isolated from all its connections, forming a flap connected only by its upper border. The mass was then forcibly drawn downwards, and cut off. The portion thus removed was rectangular in shape, three inches long. When spread out, there was from a quarter to half an inch of the healthy mucous membrane all round the growth. The disease itself had extended into the ischio-rectal fossa to the depth of three-fourths of an inch. The growth towards the bowel was deeply ulcerated in the centre. At the margins the growth appeared to be insinuating itself between the muscular and mucous coats, lifting up the latter, so as to form a ring-like elevation. From the lower border were two fungating masses. Beneath the microscope the specimen proved to be a beautiful example of adenoid cancer. The patient convalesced without a single bad symptom, her only trouble being her inability to pass water for ten days. By August 18 she was sufficiently convalescent to go to Bournemouth, but had only slight control over the motions.

The following notes complete the case :

Oct. 30, 1880.—The wound has perfectly healed, and she has little or no trouble as regards retention. There

is no sign of any return of the disease, but there is a tendency to contraction of the anal orifice. She was at once advised to pass a full-sized bougie daily.

April 1882.—I examined the patient, and there was no sign of any return of the disease. The part all feels perfectly supple and normal, and there is scarcely any contraction, and she feels perfectly strong and well, and has become quite stout.

Sept. 26, 1883, I received the following letter (three years after the operation) :

“MY DEAR SIR,—I am very thankful to say, in reply to your inquiry, that I am still perfectly free from any appearance of disease. There is no pain whatever in any part, and no weakness. Indeed, nothing at all that I could in any way complain of. The contraction is not sufficient to necessitate the use of the instrument you furnished me with, and I have discontinued its use for nearly a twelvemonth. My general health is as good as ever.”

May 1900. There has never been any return, and the patient is still in perfect health, and the bowel gives no trouble at all.

A patient, a woman aged fifty, was kindly placed under my care at the hospital by Dr. Griffith. I am indebted for the following notes to Mr. Balgarnie, her dresser.

The woman was admitted on Dec. 15, 1885. She dates her present illness from the spring, when she first noticed pain in the lower part of the back, and soon afterwards pain during defæcation. The character of her motions gradually altered, becoming smaller in size, and at times flattened, and generally tinged with blood. The frequency of her stools increased, at first to three or four times a day, but latterly much more often. She has been getting thinner, and at times has much severe pain, which she describes as like “labour pains.”

The patient on admission looked weak and anæmic, with a feeble pulse. She had nearly constant pain, and was much distressed by a troublesome diarrhoea, having to go to stool as often as ten or twelve times in the night. The act of defæcation was very painful, and nearly always attended by loss of blood. On examination, the anus appeared healthy, and on introducing the finger the mucous membrane for about three inches felt smooth and natural. The finger then came in contact with a mass feeling not unlike an enlarged cervix uteri. Around this was a cul-de-sac, deeper posteriorly than anteriorly. The mass itself was hard and nodular. The opening through it would only admit the tip of the finger, and the bowel at the constricted point was firmly fixed to the surrounding structures.

The patient, not wishing then to stay in the hospital, left, but was re-admitted on Feb. 1. She had become weaker, and her symptoms had increased since her discharge. The mass also had grown considerably, and could now be felt to be within an inch and a half of the anus. On Feb. 8, 1886, the case being considered unsuitable for excision, I performed colotomy. The wound united by first intention. No motion passed through it for a week. During the next six weeks a certain amount of fæces passed through the rectum as well as through the wound. This gradually ceased, and when she was discharged in March everything passed through the artificial anus. She improved very much whilst in the hospital, and was comparatively free from pain.

April 1887.—The patient is not only alive, but wonderfully improved; and, notwithstanding that the local growth has made some advance, her general health and strength is far better than it was a year ago. She is no longer troubled with diarrhoea, but has one good motion daily through the artificial anus, and she has been able to attend as usual during the year to her domestic duties. The artificial anus readily admits the forefinger, and

the mucous membrane is exactly level with the skin. There is no sign of cicatricial tissue round the orifice, which is perfectly soft and dilatable. The patient knows when she is going to pass a motion, which she has the power of controlling, there being no involuntary escape. In fact, the patient herself says she is no more troubled with the artificial anus than when the opening was in the natural situation. The patient was shown at the Medical Society.

A lady, sixty-two, was brought to me by Dr. Rushworth, of Hampstead, in Feb. 1898. For about a year she had been much troubled with irritability of the bowels, often requiring to go to the closet ten or twelve times a day, but mostly only a little blood-stained mucus was passed. An examination showed at the height of four inches, and involving the whole circumference of the bowel for two inches, a mass of adenoid cancer, ulcerated in the centre, with hard heaped-up edges. Assisted by Dr. Rushworth, on Feb. 16, 1898, I sawed across the sacrum two and a half inches above its junction with the coccyx. This gave an excellent view of the disease, and enabled the whole of the growth to be removed by taking out completely about three inches of the bowel. It was adherent to the peritoneum, which had to be opened but was closed again with sutures. About three and a half inches of healthy bowel intervened between the cut section and the anus. The two cut ends could not be drawn together, so the upper end was fixed to the upper angle of the wound. The patient recovered without mishap. A year later, on examination, there was no sign of recurrence; the anus was at the lower part of the sacrum about four inches behind its normal position. Just below that, but somewhat contracted up, was the entrance to the lower segment of the bowel that had been left. One finger in this and one in the anus met and showed the bowel quite healthy. She had no control. I promised her if there was no return of the disease in another year from this, an attempt should be

made to restore the bowel by joining the cut segments. In August 1902, again assisted by Dr. Rushworth, I carefully dissected out the two ends. These, which previously could not be brought together, now came easily in contact without tension, and an end to end anastomosis was made. The parts completely healed. She is now, 1906, in good health, passes all the motions through the natural anus, and *has perfect* control, and there is no sign of recurrence.

## EXPLANATION OF TABLE A

THE table is arranged in chronological order, and includes, with perhaps a few accidental omissions, all examples of rectal cancer that have come under my observation in private practice. It was the original intention to have included in the Table the hospital cases as well, which would have considerably more than doubled this number. I found, however, that as the cases extended over so long a period (twenty-eight years) it was impossible to follow out the subsequent histories of the hospital patients, except in a limited number, and therefore for statistical purposes they would not have been reliable. I have, however, always kept a record of my private cases, including, in most instances, the name of the medical practitioner who sent me the patient, and the patient's address. It has thus been possible to obtain the ultimate history of the patients in a large number of cases. My general impression is that there would have been very little difference in the relative figures had the hospital series been included. In most of the cases the name of the medical attendant is given, as a means of identification and for correction if necessary.



TABLE A  
A RECORD OF 380 CONSECUTIVE CASES OF RECTAL CANCER IN THE PRIVATE PRACTICE OF THE AUTHOR

Number.	Date.	Medical Attendant.	Sex.	Age.	Duration of Symptoms.	Height of Disease from Anus.	Treatment.	Result.		Remarks.
								Immediate.	Secondary.	
1	1878	Sir James Paget	M.	65	1 year	3 inches	Excision	Recovery	Recurred	Recurred in 12 months; second operation; patient died 3½ years after first operation.
2	1880	Dr. Matthews Duncan	F.	48	6 months	1 inch	Excision	Recovery	—	Alive and well, with good control 22 years after operation; disease on left wall two inches in diameter; ulcerated hard friable edges; microscope: adenoid cancer.
3	1881 Mar.	Dr. Smith (Keyworth)	F.	50	3 months	High up	Palliative	—	—	Lived 4 months.
4	1881 Apr.	Dr. Fletcher	M.	56	14 months	5 inches	Palliative	—	—	Lived 6 months.
5	1881 Oct.	Dr. Forbes (Rock-Ferry)	M.	14	2 months	3 inches	Palliative	—	—	Lived 3 months; grew most rapidly; death 3 months later.
6	1882	Dr. Parsons (Bridgwater)	M.	44	10 months	4 inches	Palliative	—	—	Died within year; obstruction and implication of glands.

# CASES OF RECTAL CANCER

187

7	1882 Feb.	Dr. Gimson (Witham)	M.	50	Uncertain	Pelvis blocked up	Palliative	—	—	Lived 8 months ; death from obstruction.
8	1882 July		M.	33	2 years	Extensive	Palliative	—	—	Lived 5 months.
9	1882 Nov.	Dr. Ransom (Bowden)	F.	65	18 months	2 inches	Palliative	—	—	Lived 10 months.
10	1883 May	Dr. Dousett (Hastings)	F.	61	Not stated	2½ inches	Refused	—	—	
11	1883 Dec.	Dr. Wyatt	M.	66	Nearly 4 years	5 inches	Palliative	—	—	Disease advanced very slowly.
12	1884 Mar.	Dr. Gimson	M.	35	3 months	High up	Refused	—	—	Lived 9 months.
13	1884 July	Alban Doran	F.	45	14 months	High up	Palliative	—	—	Death, 10 months.
14	1884 Aug.	Dr. Smith (Keyworth)	F.	46	3 years	4 inches	Palliative	—	—	Death, 13 months.
15	1884 Nov.	Mr. Lomax	M.	69	8 months	3 inches	Palliative	—	—	Disease at first mistaken for fibrous stricture.
16	1884 Dec.	—	F.	45	5 months	—	Refused	—	—	
17	1884 Dec.	Dr. Stokes (Highbury)	M.	70	2 years	5 inches	Colotomy	Recovery	—	Lived 7 months. (Lumbar.)

Number.	Date.	Medical Attendant.	Sex.	Age.	Duration of Symptoms.	Height of Disease from Anus.	Treatment.	Result.		Remarks.
								Immediate.	Secondary.	
18	1885 June	Sir Andrew Clark	F.	46	Not stated	3 inches	Excision	Recovery	Recurred	Recurrence 1 year; death, 18 months.
19	1885 June	Dr. Crabbe	M.	69	No symptom	High up	Palliative	—	—	Patient had no symptoms of any kind till a week before my examination; had then a sudden and profuse hæmorrhage; a large amount of disease but no stricture. Disease made very little advance up to the time of death, 3 years later.
20	1885 July	Dr. Allen Sturge	M.	62	8 months	Prostate involved	Palliative	—	—	Lived 6 months.
21	1885 July	Sir Spencer Wells	M.	55	8 months	3½ inches	Excision	Recovery	Recurred	Growth two inches diameter on anterior wall; death from recurrence 2 years.
21	1885 Aug.	Dr. Bingley	M.	73	1 year	3 inches	Palliative	—	—	Lived 8 months.
23	1886 Jan.	Dr. Stanley Smith	F.	40	8 months	3 inches	Excision	Recovery	Well 20 years	Patient was operated upon in 1885 by Mr. Henry Smith; recurred in 6 months. Examination under ether showed

a hard circular growth the size of half-a-crown, deeply ulcerated, at five inches from anus on the anterior wall. The bowel was movable, and the growth could be drawn down to within three inches of the anus, and after a posterior proctotomy a good view could be obtained. The growth was removed; peritoneum not opened. Five months later symptoms still present. Examination showed a recurrence at the old site  $1\frac{1}{4}$  in. in diameter and very hard; third operation. The disease was again excised with a good half-inch margin; the whole thickness of the bowel removed, including peritoneal coat, the peritoneal opening being closed with fine silk. Microscope: typical adenoid cancer. Patient has never had further recurrence; has remained quite well; has perfect control, and no trouble.

Lived 8 months; disease completely blocked up pelvis. Colotomy done for complete obstruction. (Lumbar.)

24	1886 Jan.	Dr. Swindell (Finchley)	M.	35	10 months	3 inches	Colotomy	Recovery	—
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Number.	Date.	Medical Attendant.	Sex.	Age.	Duration of Symptoms.	Height of Disease from Anus.	Treatment.	Result.		Remarks.
								Immediate.	Secondary.	
25	1886 Mar.	Dr. Batten (Gloucester)	M.	70	Doubtful	6 inches	Palliative	—	—	Lived 1½ years; disease high up, and only discovered after a second examination under anæsthetics. Death from secondary deposits in brain.
26	1886 Apr.	Dr. Walters (Reigate)	M.	60	9 months	6 inches	Palliative	—	—	Lived 10 months; examination without anæsthetic. Nothing could be felt. Examination month later under ether showed ring of cancer six inches up the bowel.
27	1886 May	Sir Andrew Clark	F.	50	2½ years	2 inches	Palliative	—	—	
28	1886 June	Dr. Foreman (Bournemouth)	M.	59	1 year	High up	Colotomy	Recovery	—	Lived 8 months. (Lumbar.)
29	1886 July	Dr. Lattay (Kensington)	F.	49	9 months	Around anus	Palliative	—	—	
30	1886 Oct.	Dr. Wade (Chislehurst)	M.	60	2 years	High up	Colotomy	Recovery	—	Lived 19 months; great relief; able to go to his office daily till within 6 months of his death. (Lumbar.)
31	1886 Nov.	Dr. Geo. Hastings	M.	61	18 months	2 inches	Excision later Colotomy	—	Recurred	Recurred in 4 months; subsequent colotomy.

32	1886 Nov.	Dr. Bryan Jones (Epsom)	M.	47	14 months	2½ inches	Palliative	—	—	Died of obstruction in 2 months.
33	1886 Dec.	Harrison Cripps	F.	70	Not stated	High up	Colotomy	Recovery	—	Lived 2 years.
34	1887 Mar.	—	F.	50	14 months	4 inches	Palliative	—	—	Lived 4 months. This patient had very slight symptoms, and till the growth was detected had never felt ill.
35	1887 Apr.	Sir W. Whitla (Belfast)	F.	49	8 months	4 inches	Excision	Recovery	Well 19 years	Operation at Belfast, assisted by Mr. A. Bowlby. The disease was very extensive, commencing three inches from anus and extending upwards to five inches. Operation severe. Peritoneum being exposed for two inches, it was not opened, the bowel being stripped off it. The patient unfortunately neglected herself, and a year later there was a considerable stricture. I advised that this should be dilated by bougies; this not done. Two years later had a colotomy performed by Sir Alfred Cooper, who kindly sent me a letter received from this patient, January 1906, from which I give the following extract: "I am still about, and very much so. I am

Number.	Date.	Medical Attendant.	Sex.	Age.	Duration of Symptoms.	Height of Disease from Anus.	Treatment.	Result.		Remarks.
								Immediate.	Secondary.	
36	1887 May	Not stated	F.	30	5 months	4½ inches	Colotomy	Recovery	—	able to walk three or four miles without fatigue, and to all appearance am perfectly well, 19 years since the operation."
37	1887 July	Dr. Kimpster	F.	71	9 months	3½ inches	Palliative	—	—	
38	1887 Oct.	Dr. Foreman (Stoke Newington)	M.	48	2 years	1½ inches	Colotomy	Recovery	—	
39	1887 Oct	Harrison Cripps	F.	48	10 months	4 inches	Colotomy	Recovery	—	Lived 3 years.
40	1887 Nov.	Dr. Kinneir	F.	39	—	3 inches	Excision	Not stated	—	
41	1887 Nov.	Harrison Cripps	F.	37	8 months	2 inches	Excision	Recovery	Well 5 years	Two inches of the vaginal septum removed. When last seen had gained two stone in weight; cicatrix soft and healthy; fair control.

# CASES OF RECTAL CANCER

193

	1887 Dec.	Dr. James Andrews	M	76	6 months	2 inches	Excision	Death	—	
42										Patient did well for 14 days ; then became restless and wandering at nights ; gradually became weaker ; death on 22nd day ; wound remained healthy.
43	1887 Dec.	Dr. Godson	F.	50	15 months	4 inches	Colotomy	Recovery	—	Lived 6 months.
44	1887 Dec.	Dr. Moore (Blackheath)	M.	67	2 years	1½ inches	Refused	Recovery	—	Lived 7 months
45	1888 Jan.	Dr. F. O. Smith	M.	55	19 months	1 inch	Colotomy	Recovery	—	Lived 18 months. Spread upwards from anus.
46	1888 Jan.	Dr. Edlin	M.	43	8 months	4 inches	Colotomy	Recovery	—	Lived 2 years.
47	1888 Jan.	Dr. M. Duncan	F.	51	9 months	4 inches	Palliative	—	—	
48	1888 Feb.	Dr. Laurie	M.	65	Not stated	High up	Colotomy	Recovery	—	Lived over 2 years
49	1888 Mar.	Sir L. Brunton	F.	51	2 years	High up	Palliative	—	—	
50	1888 May	Dr. Fletcher (Camden Road)	M.	41	4 months	2 inches	Excision	Recovery	Well 16 years	The growth involved the posterior half of the rectum and was two inches in length. The mucous membrane was intact over it,



Number.	Date.	Medical Attendant.	Sex.	Age.	Duration of Symptoms.	Height of Disease from Anus.	Treatment.	Result.		Remarks.
								Immediate.	Secondary.	
51	1888 June	Dr. Gillibrand	F.	43	10 months	4 inches	Colotomy	Recovery	—	with the exception of an area in the centre, the size of a shilling, which was ulcerated. The posterior two-thirds of the rectum excised. Microscope : adenoid cancer. I examined the case 16 years after operation ; good control ; no sign of recurrence. He used a bougie once a week for the first 5 years.  Lived 2½ years, for two of which was able to do her household duties and go to church on Sundays. She gradually became weaker, but never had any pain after the colotomy.
52	1888 Aug.	Dr. Scott (Bourne-mouth)	M.	54	6 months	2½ inches	Excision Colotomy	Recovery	Recurred	In 4 months a slight recurrence. Advised to have it again removed. Preferred a cancer curer, who treated it with electrolysis, which seemed to irritate and make it grow more rapidly ; colotomy performed for obstruction.

# CASES OF RECTAL CANCER

195

53	1888 Sept.	Dr. Innes (Hertford)	M.	60	2 years	2 inches	Refused	—	—	Lived 10 months. The mother of this patient died of rectal cancer 5 years after the death of her son.
54	1888 Nov.	Dr. Hastings	M.	18	4 months	High up	Colotomy	Recovery	—	Lived 4 months.
55	1888 Nov.	Sir Spencer Wells	M.	73	2 years	1 inch	Palliative	—	—	Lived 2 years. Fixed ring of cancer junction of rectum with sigmoid, diagnosed by abdominal section. Colotomy; disease eventually extended into bladder.
56	1889 Mar.	Dr. Goodchild	F.	54	8 months	High up	Colotomy	Recovery	—	Dr. Ball writes two years after the operation: "Patient can do all her household work and walk five or six miles without fatigue, and practically her health is as good as it ever was." Lived 4 years.
57	1889 Apr.	Dr. Ball	F.	45	9 months	3 inches	Colotomy	—	Recurred	Lived 18 months.
58	1889 June	Dr. Hastings	F.	50	A few months	4 inches	Colotomy	Recovery	—	A short mesentery. Intestine fell back on fifth day. Faces extensively extravasated into the
59	1889 June	Dr. Hutson (Barbadoes)	F.	52	8 months	3½ inches	Colotomy	Recovery	—	

Number.	Date.	Medical Attendant.	Sex.	Age.	Duration of Symptoms.	Height of Disease from Anus.	Treatment.	Result.		Remarks.
								Immediate.	Secondary.	
60	1889 July	Dr. De la Cour	F.	60	2 years	3½ inches	Colotomy	Recovery	—	peritoneal cavity. Washed out thoroughly and bowel re-stitched to the wound. A drainage tube was used. Recovered without a bad symptom. Lived 3 years. Dr. Hutson wrote: "July 1892. — I thought you would like to hear about your patient, who lived just over 3 years. She got on very well for 2½ years, enjoying life in her quiet way, going to church, visiting friends, &c., and was very grateful for the operation."
61	1889 Aug.	Mr. Lawrence	F.	65	1 year	5 inches	Colotomy	Recovery	—	Lived a few months.
62	1889 Sept.	Dr. Foster	F.	60	2 years	4 inches	Colotomy	Recovery	—	Lived 2 years and 3 months.
63	1889 Sept.	Dr. Cubitt (Stroud)	M.	63	1 year	3 inches	Colotomy	Recovery	—	Lived 7 months. Colotomy for complete obstruction. Lived 18 months. Dr. Cubitt wrote: "The operation pro-

cured him a most easy prolongation of life. He had absolutely no pain; no nausea or vomiting; no intestinal trouble till within a few weeks of the end. He may be said to have enjoyed life: eating, sleeping and drinking, and doing his work as parish priest. I send these notes to complete a record of successful surgical work."

Death on 8th day.

Recurrence 7 months. Colotomy; lived 6 months.

In this case the rectum was subsequently excised in America.

Lived 3 months. Ulcerated into bladder. Died of sudden hæmorrhage from bladder.

Lived 13 months. Colotomy for complete obstruction.

64	1889 Oct.	Dr. Kingston Barton	M.	71	8 months	High up	Colotomy	Death	—	
65	1889 Oct.	Dr. Reynolds	F.	67	4 months	1½ inches	Excision Colotomy	Recovery	Recurred	
66	1889 Nov.	Mr. Meredith	F.	54	Not stated	High up	Palliative	—	—	
67	1889 Nov.	Dr. Elliott (Snaresbrook)	M.	68	4 months	1 inch	Colotomy	Recovery	—	
68	1890 Jan.	Dr. Terry (Newport Pagnell)	M.	67	9 months	Anal margin	Colotomy	Recovery	—	
69	1890 Feb.	Christopher Heath	M.	59	8 months	2 inches	Refused	—	—	

Number.	Date.	Medical Attendant.	Sex.	Age.	Duration of Symptoms.	Height of Disease from Anus.	Treatment.	Result.		Remarks.
								Immediate.	Secondary.	
70	1890 Feb.	Mr. Boyce Barrow	F.	63	9 months	4 inches	Palliative	—	—	
71	1890 Mar.	Sir L. Brunton	M.	40	18 months	3½ inches	Palliative	—	—	Lived 5 months.
72	1890 May	Dr. Perry (Folkestone)	F.	40	1 year	3½ inches	Refused	—	—	
73	1890 May	Dr. Willis	M.	68	13 months	3 inches	Refused	—	—	
74	1890 May	Harrison Cripps	M.	62	1 year	3½ inches	Colotomy	Recovery	—	Lived 13 months.
75	1890 May	Dr. Ironside	F.	50	8 months	4 inches	Excision	Recovery	Well 12 years	Dr. Ironside wrote as follows July 1902: "The patient is perfectly well, and there is no sign of recurrence."
76	1890 June	Harrison Cripps	M.	55	14 months	Whole of pelvis	Palliative	—	—	Lived 4 months.
77	1890 June	Dr. Horsford (Melford)	M.	75	11 months	3 inches	Refused	—	—	

78	1890 Aug.	Dr. Gimson	F.	37	8 months	3½ inches	Colotomy	Recovery	—	Lived 6 months. Obstruction and general dissemination over abdominal cavity.
79	1890 Aug.	Dr. Wilkes Harrison Cripps	F.	55	6 months	High up	Colotomy	Death	—	Obstruction practically complete. The greatest difficulty in uniting bowel to skin. The patient very fat; stitches gave way; death sixth day.
80	1890 Aug.	Dr. Fowler (Epping)	M.	35	18 months	3 inches	Colotomy	Death	—	Complete obstruction 12 days, with faecal vomiting, which continued till death, 24 hours after operation.
81	1890 Sept.	Harrison Cripps	M.	63	Not stated	1½ inches	Palliative	—	—	Lived 4 months.
82	1890 Sept.	Dr. Goddard (Highbury)	F.	40	8 months	4 inches	Colotomy	Recovery	—	Lived 13 months.
83	1890 Nov.	Dr. Whiting	M.	60	8 months	1½ inches	Palliative	—	—	Lived 3 months. Prostate involved.
84	1891	Dr. Adams	M.	70	1 year	1½ inches	Palliative	—	—	Lived 2 months.
85	1891 Feb.	Dr. Roe (Ellesmere)	M.	59	1 year	4 inches	Colotomy	Recovery	—	Dr. Roe wrote as follows: "The patient lived 2½ years. He had very little pain, which I attribute to the bowels acting freely; towards the end urine came through colotomy opening."

Number.	Date.	Medical Attendant.	Sex.	Age.	Duration of Symptoms.	Height of Disease from Anus.	Treatment.	Result.		Remarks.
								Immediate.	Secondary.	
86	1891 Feb.	Dr. Windle (Southall)	M.	45	9 months	3 inches	Palliative	—	—	
87	1891 Feb.	Sir A. Clark	M.	60	18 months	1 inch	Colotomy	Recovery	—	Lived 1 year.
88	1891 Mar.	Dr. Bell	M.	64	10 months	5 inches	Colotomy	Recovery	—	Lived 2 years.
89	1891 Mar.	Dr. Brodie (Wickham Market)	M.	45	1 year	4 inches	Colotomy	Recovery	—	Lived 4½ years. Dr. Brodie stated that the patient had no pain and lived in comparative com- fort, the opening acting well and giving no trouble.
90	1891 May	Dr. Pope (Tring)	M.	60	6 months	3½ inches	Colotomy	Recovery	—	
91	1891 May	Dr. Tyrrell (Malvern)	M.	39	5 months	4 inches	Colotomy	Recovery	—	Lived 7 months.
92	1891 June	Dr. Bows (Herne Bay)	F.	65	9 months	3½ inches	Palliative	—	—	Lived 6 months.
93	1891 July	Dr. Wyatt	M.	54	10 months	3 inches	Palliative	—	—	

# CASES OF RECTAL CANCER

201

94	1891 July	Sir A. Clark	M.	65	9 months	1½ inches	Refused	—	—	Lived 8 months.
95	1891 Aug.	Dr. Toller	F.	50	2 years	2 inches	Palliative	—	—	Lived 5 months.
96	1891 Aug.	Dr. Dunn	M.	48	1 year	3 inches	Palliative	—	—	Lived 2 years 1 month.
97		Harrison Cripps	M.	64	7 months	4 inches	Colotomy	Recovery	—	Lived 2 years 2 months. Patient had locomotor ataxy; was able to attend to business daily for 2 years, the opening giving little trouble. He had a sudden attack of abdominal pain and died in 3 days.
98	1891 Sept.	Dr. Morrison	M.	61	9 months	3½ inches	Colotomy	Recovery	—	Lived 6 months.
99	1891 Sept.	Harrison Cripps	M.	68	4 months	3 inches	Palliative	—	—	Lived 2 months.
100	1891 Oct.	Dr. Scott (Ealing)	F.	73	18 months	4 inches	Palliative	—	—	Lived 15 months.
101	1891 Oct.	Harrison Cripps	F.	40	13 months	High up	Colotomy	Recovery	—	Lived 4 months
102		Mr. Johnson	F.	61	1½ years	4 inches	Palliative	—	—	Lived 7 months.
103	1891 Oct.	Mr. Webb	M.	60	15 months	3 inches	Palliative	—	—	

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Number.	Date.	Medical Attendant.	Sex.	Age.	Duration of Symptoms.	Height of Disease from Anus.	Treatment.	Result.		Remarks.
								Immediate.	Secondary.	
104	1891 Nov.	Dr. Kane (Kingston)	F.	68	14 months	High up	Colotomy	Recovery	—	Lived 2 years 5 months.
105	1891 Dec.	Dr. Joseph Kidd	M.	58	10 months	3 inches	Palliative	—	—	Lived 6 months.
106	1892 Jan.	Dr. Boulton	M.	60	1 year	2 inches	Colotomy	Recovery	—	
107	1892	Dr. Kane Dr. Toller	M.	59	6 months	2 inches	Excision	Recovery	Well 14 years	Disease 1½ inches on posterior wall, ulcerated in centre; hard edges; very freely excised. Dr. Toller writes, January 1906: "Is in good health, and has no trouble in the rectum."
108	1892 Mar.	Dr. Champneys	F.	31	9 months	2 inches	Palliative	—	—	Lived 8 months.
109	1892 Mar.	Dr. A. Bright	F.	64	3 years	High up	Colotomy	Recovery	—	Lived 9 months.
110	1892 May	Dr. Lycett Burd	M.	60	A few weeks	3½ inches	Excision	Recovery	Recurred	Recurred; death in 7 months

# CASES OF RECTAL CANCER

203

111	1892 May	Dr. Shone	M.	70	9 months	3 inches	Palliative	—	—	Lived 4 months.
112	1892 May	Dr. Green (Portsmouth)	M.	64	1 year	4 inches	Palliative	—	—	Lived 3 years. Died from cancer of liver.
113	1892 May	Dr. Humphrey (Cheltenham)	M.	43	9 months	3 inches	Refused	—	—	Lived 5 months.
114	1892 Aug.	Sir Russell Reynolds	M.	58	18 months	3 inches	Refused	—	—	
115	1892 Aug.	Dr. Ludwig	M.	57	1 year	2½ inches	Palliative	—	—	
116	1892 Aug.	Dr. Stott	M.	54	5 months	3 inches	Refused	—	—	
117	1892 Oct.	Dr. Kane	M.	20	Not stated	4 inches	Colotomy	Recovery	—	Lived over 2 years. Operation for complete obstruction 10 days.
118	1892 Nov.	Harrison Cripps	M.	62	15 months	½-inch	Refused	—	—	
119	1892 Nov.	Dr. Lewis (Hamilton Terrace)	F.	60	6 months	2 inches	Excision Colotomy	Recovery	Recurred	Recurred in 10 months. Complete obstruction; colotomy; lived 1 year 6 months.
120	1892 Nov.	Dr. Garrard	M.	70	8 months	4½ inches	Colotomy	Recovery	—	Lived 1 year.

Number.	Date.	Medical Attendant.	Sex.	Age.	Duration of Symptom.	Height of Disease from Anus.	Treatment.	Result.		Remarks.
								Immediate.	Secondary.	
121	1892 Nov.	Dr. Liddon	F.	60	6 months	3 inches	Excision	Recovery	Well 14 years	Assisted by Mr. Bowlby I removed the lower three inches of the posterior two-thirds of the rectum. Microscope : adenoid cancer. Patient is now, April 1906, perfectly well ; the parts are soft and supple, and she has perfect control. Bougie used for four years.
122	1892 Nov.	Dr. Beckett	M.	53	8 months	4½ inches	Refused	—	—	
123	1892 Dec.	Sir James Paget	M.	54	6 months	3 inches	Refused	—	—	Patient, a wealthy man, refused operation on the ground of expense. The disease was a circular patch on posterior wall.
124	1892 Dec.	Mr. D'Arcy Power	M.	68	8 months	3½ inches	Colotomy	Recovery	—	Lived 3 years ; had very little trouble till the end ; went out to Jamaica and back on business during the second year.
125	1892 Dec.	Dr. Gimson	M.	58	9 months	1½ inches	Palliative	—	—	Lived 10 months.

126	1893 Jan.	Dr. Alexander	F.	54	1 year	4 inches	Colotomy	Recovery	—	Lived over 2 years. Dr. Alexander, writing 18 months after the operation, says: "The patient is much improved in general health by the colotomy. I attribute this to the better appetite and to the comfort of the bowels, acting at regular intervals, whereas before there was constant diarrhoea."
127	1893 Jan.	Harrison Cripps	F.	48	2 years	$\frac{1}{2}$ inch	Palliative	—	—	Lived 5 months. In addition to cancer of the rectum this patient had cancer of the breasts and disseminated nodules all over the skin.
128	1893 Feb.	Sir Thomas Barlow	M.	48	6 months	5 inches	Colotomy	Recovery	—	Lived over 3 years. Two years after the colotomy Sir Thomas Barlow wrote: "The case is most satisfactory; the patient can walk eight or ten miles, and does his clerical work on Sundays."
129	1893 Feb.	Dr. Thompson (Seven Oaks)	M.	45	1 year	2 inches	Excision	Recovery	Recurred	Patient died with recurrence after 13 months.
130	1893 Feb.	Dr. Bear	F.	56	8 months	3 inches	Excision Colotomy	Recovery	Recurred	Recurred in 8 months.

Number.	Date.	Medical Attendant.	Sex.	Age.	Duration of Symptoms.	Height of Disease from Anus.	Treatment.	Result.		Remarks.
								Immediate.	Secondary.	
131	1893 Feb.	Harrison Cripps	M.	70	1½ years	High up	Colotomy	—	—	
132	1893 Feb.	Dr. Percival (Northampton)	M.	57	8 months	2 inches	Excision	Recovery	Recurred	Patient lived 13 months.
133	1893 Feb.	Dr. Lowe	M.	58	14 months	3 inches	Excision	Recovery	Recurred	Patient lived 3 years. The disease had invaded the prostate, in which position it recurred.
134	1893 Mar.	Dr. Reynolds	F.	48	1 year	1½ inches	Excision Colotomy	Recovery	Recurred	Recurred in 15 months; colotomy; patient lived 2½ years.
135	1893 May	Dr. Wilkes	F.	65	14 months	5 inches	Palliative	—	—	Lived 11 months.
136	1893 May	Dr. Fulcher	F.	45	Not stated	3 inches	Colotomy	Death	—	The patient had had complete obstruction for 11 days, with fecal vomiting; death on 4th day: abdomen full of secondary deposits.
137	1893 May	Dr. Hobday	M.	43	18 months	2 inches	Palliative		—	Lived 5 months.

138	1893 June	Dr. Thompson	M.	70	18 months	3½ inches	Colotomy	Recovery	—	Lived 5 months. The disease was very advanced, causing obstruction.
139	1893 June	Harrison Cripps	F.	55	15 months	4 inches	Palliative	—	—	Lived 4 months.
140	1893 July	Dr. Randwick	M.	61	9 months	Junction of sigmoid with rectum	Colotomy	Recovery	—	Transverse colotomy.
141	1893 Aug.	Dr. Steggall	F.	60	Over a year	4 inches	Refused	—	—	Lived 7 months.
142	1893 Sept.	Dr. Buller	M.	70	8 months	5 inches	Refused	—	—	Lived 1 month. Died with fecal vomiting and other signs of complete obstruction.
143	1893 Sept.	Dr. Wade	M.	60	15 months	2½ inches	Excision Colotomy	Recovery	Recurred	Lived 4 years. Sacrum partly removed; recurred in 18 months; colotomy. Patient remained in active work as a surveyor till within 3 months of his death.
144	1893 Oct.	Dr. Turner (Annesley)	M.	53	14 months	4½ inches	Excision	Recovery	—	Lived 16 months; died with secondary deposits in liver; no local recurrence.
145	1893 Oct.	Dr. Turner	M.	48	10 months	5 inches	Colotomy	Recovery	—	Lived 2 years 8 months.

Number.	Date.	Medical Attendant.	Sex.	Age.	Duration of Symptoms.	Height of Disease from Anus.	Treatment.	Result.		Remarks.
								Immediate.	Secondary.	
146	1893 Nov.	Dr. Broadbent	M.	65	9 months	5 inches	Colotomy (complete obstruction)	Death	—	Had seen patient five weeks previously and urged a colotomy, which was refused. On seeing this patient the second time, abdomen enormously distended; complete obstruction 13 days; fecal vomiting. On opening the abdomen a large amount of fetid gas escaped; the actual perforation could not be found. Death on 6th day.
147	1893 Nov.	Dr. Macdonald	M.	64	1 year	2 inches	Excision	Recovery	—	The last 3½ inches of the rectum completely removed; subsequent history not traced.
148	1893 Nov.	Dr. Carless	M.	54	6 months	4 inches	Excision	Recovery	Well 5 years	Died suddenly of heart disease 5 years after operation; no recurrence.
149	1893 Dec.	Sir Lauder Brunton	F.	60	6 months	3½ inches	Excision	Death	—	The disease extended very high; peritoneal cavity extensively opened; death on 4th day, probably from peritonitis; no post-mortem.

# CASES OF RECTAL CANCER

209

150	1894 Jan.	Dr. Swift	M.	69	9 months	4 inches	Refused	—	—	
151	1894 Jan.	Mr. Christopher Heath	M.	70	18 months	1 inch	Colotomy	Death	—	Obstruction complete 7 days ; operation very difficult, owing to enormous fatness of patient, taking over an hour ; death in 24 hours.
152	1894 Feb.	Dr. Chambers	F.	69	2 years	3 inches	Palliative	—	—	Lived 3 months.
153	1894 Feb.	Dr. Jukes (Horsham)	M.	71	18 months	4½ inches	Palliative	—	—	Lived 7 months.
154	1894 Feb.	Harrison Cripps	M.	62	9 months	3½ inches	Colotomy	Recovery	—	Lived nearly 3 years.
155	1894 Feb.	Dr. Carless (Devonshire)	M.	38	8 months	2 inches	Excision	Recovery	Not stated	
156	1894 Feb.	Dr. Irving	M.	42	1 year	5½ inches	Colotomy	Recovery	—	
157	1894 Mar.	Dr. Lang	M.	60	2 years	3 inches	Palliative	—	—	Lived 4 months.
158	1894 Mar.	Dr. Connor	M.	60	14 months	1 inch	Excision	Recovery	Recurred	Death in 11 months.
159	1894 Apr.	Dr. Maurice (Reading)	M.	62	18 months	4 inches	Colotomy	Recovery	—	Advised an excision, but curiously enough for some reason refused,



Number.	Date.	Medical Attendant.	Sex.	Age.	Duration of Symptoms.	Height of Disease from Anus.	Treatment.	Results.		Remarks.
								Immediate.	Secondary.	
160	1894 May	Dr. Jones King			Not known	3 inches	Refused	—	—	and requested a colotomy. Dr. Maurice writes: "Our patient lived 3 years after the colotomy. He suffered very little, and till the last few months scarcely looked ill."
161	1894 May	Dr. Hoyland	F.	68	4 months	3 inches	Refused	—	—	
162	1894 May	Dr. Baines (Toronto)		40	2 years	2 inches	Colotomy	Recovery	—	
163	1894 June	Dr. Kane	M.		14 months	5 inches	Palliative	—	—	Over 2 years. The patient's father called 2 years after the operation, saying "his son enjoyed excellent health, and attended to business daily."
164		Mr. Browne	M.	52	1 year	4 inches	Colotomy	Recovery	—	11 months.
165		Dr. Parsons	F.	61	2 years	3 inches	Palliative	—	—	Lived 2 years.
										Lived 7 months.

166		Harrison Cripps	F.	50	4 months	2 inches	Palliative	—	—	Lived 5 months. Patient very fat and confirmed dipsomaniac.
167	1894 July	Dr. Philpots	M.	40	5 months	4 inches	Excision Colotomy	Recovery	Recurred	Lived 18 months. Unfortunately the patient neglected the bougie, and 6 months after the operation he had complete obstruction. Colotomy performed, and death took place 1 year later.
168	1894	Harrison Cripps	M.	45	Not stated	6 inches	Palliative	—	—	Lived 4 months.
169	1894 Aug.	Dr. Musson	M.	50	6 months	4 inches	Colotomy	Recovery	—	Lived 2 years. Patient lived in comparative comfort. A year after the operation he was able to enjoy salmon fishing and spent his days wading.
170	1894 Aug.	Dr. Roberts (Deal)	M.	52	2 months	4 inches	Colotomy	Recovery	—	Died with large secondary deposits in the liver 6 months after colotomy.
171	1894 Aug.	Dr. Tanner	M.	47	18 months	3½ inches	Palliative	—	—	—
172	1894 Aug.	Dr. Adams	M.	70	2 years	3 inches	Palliative	—	—	Lived 3 months.
173	1894 Aug.	Dr. Saunders	M.	50	9 months	4½ inches	Palliative	—	—	

Number.	Date.	Medical Attendant.	Sex.	Age.	Duration of Symptoms.	Height of Disease from Anus.	Treatment.	Result.		Remarks.
								Immediate.	Secondary.	
104	1891 Nov.	Dr. Kane (Kingston)	F.	68	14 months	High up	Colotomy	Recovery	—	Lived 2 years 5 months.
105	1891 Dec.	Dr. Joseph Kidd	M.	58	10 months	3 inches	Palliative	—	—	Lived 6 months.
106	1892 Jan.	Dr. Boulton	M.	60	1 year	2 inches	Colotomy	Recovery	—	
107	1892	Dr. Kane Dr. Toller	M.	59	6 months	2 inches	Excision	Recovery	Well 14 years	Disease 1½ inches on posterior wall, ulcerated in centre; hard edges; very freely excised. Dr. Toller writes, January 1906: "Is in good health, and has no trouble in the rectum."
108	1892 Mar.	Dr. Champneys	F.	31	9 months	2 inches	Palliative	—	—	Lived 8 months.
109	1892 Mar.	Dr. A. Bright	F.	64	3 years	High up	Colotomy	Recovery	—	Lived 9 months.
110	1892 May	Dr. Lycett Burd	M.	60	A few weeks	3½ inches	Excision	Recovery	Recurred	Recurred; death in 7 months

# CASES OF RECTAL CANCER

203

111	1892 May	Dr. Shone	M.	70	9 months	3 inches	Palliative	—	—	Lived 4 months.
112	1892 May	Dr. Green (Portsmouth)	M.	64	1 year	4 inches	Palliative	—	—	Lived 3 years. Died from cancer of liver.
113	1892 May	Dr. Humphrey (Cheltenham)	M.	43	9 months	3 inches	Refused	—	—	Lived 5 months.
114	1892 Aug.	Sir Russell Reynolds	M.	58	18 months	3 inches	Refused	—	—	
115	1892 Aug.	Dr. Ludwig	M.	57	1 year	2½ inches	Palliative	—	—	
116	1892 Aug.	Dr. Stott	M.	54	5 months	3 inches	Refused	—	—	
117	1892 Oct.	Dr. Kane	M.	20	Not stated	4 inches	Colotomy	Recovery	—	Lived over 2 years. Operation for complete obstruction 10 days.
118	1892 Nov.	Harrison Cripps	M.	62	15 months	½-inch	Refused	—	—	
119	1892 Nov.	Dr. Lewis (Hamilton Terrace)	F.	60	6 months	2 inches	Excision Colotomy	Recovery	Recurred	Recurred in 10 months. Complete obstruction; colotomy; lived 1 year 6 months.
120	1892 Nov.	Dr. Garrard	M.	70	8 months	4½ inches	Colotomy	Recovery	—	Lived 1 year.

Number.	Date.	Medical Attendant.	Sex.	Age.	Duration of Symptom.	Height of Disease from Anus.	Treatment.	Result.		Remarks.
								Immediate.	Secondary.	
121	1892 Nov.	Dr. Liddon	F.	60	6 months	3 inches	Excision	Recovery	Well 14 years	Assisted by Mr. Bowby I removed the lower three inches of the posterior two-thirds of the rectum. Microscope : adenoid cancer. Patient is now, April 1906, perfectly well ; the parts are soft and supple, and she has perfect control. Bougie used for four years.
122	1892 Nov.	Dr. Beckett	M.	53	8 months	4½ inches	Refused	—	—	
123	1892 Dec.	Sir James Paget	M.	54	6 months	3 inches	Refused	—	—	Patient, a wealthy man, refused operation on the ground of expense. The disease was a circular patch on posterior wall.
124	1892 Dec.	Mr. D'Arcy Power	M.	68	8 months	3½ inches	Colotomy	Recovery	—	Lived 3 years ; had very little trouble till the end ; went out to Jamaica and back on business during the second year.
125	1892 Dec.	Dr. Gimson	M.	58	9 months	1½ inches	Palliative	—	—	Lived 10 months.

126	1893 Jan.	Dr. Alexander	F.	54	1 year	4 inches	Colotomy	Recovery	—	Lived over 2 years. Dr. Alexander, writing 18 months after the operation, says: "The patient is much improved in general health by the colotomy. I attribute this to the better appetite and to the comfort of the bowels, acting at regular intervals, whereas before there was constant diarrhoea."
127	1893 Jan.	Harrison Cripps	F.	48	2 years	$\frac{1}{2}$ inch	Palliative	—	—	Lived 5 months. In addition to cancer of the rectum this patient had cancer of the breasts and disseminated nodules all over the skin.
128	1893 Feb.	Sir Thomas Barlow	M.	48	6 months	5 inches	Colotomy	Recovery	—	Lived over 3 years. Two years after the colotomy Sir Thomas Barlow wrote: "The case is most satisfactory; the patient can walk eight or ten miles, and does his clerical work on Sundays."
129	1893 Feb.	Dr. Thompson (Seven Oaks)	M.	45	1 year	2 inches	Excision	Recovery	Recurred	Patient died with recurrence after 13 months.
130	1893 Feb.	Dr. Bear	F.	56	8 months	3 inches	Excision Colotomy	Recovery	Recurred	Recurred in 8 months.

## CASES OF RECTAL CANCER

Number.	Date.	Medical Attendant.	Sex.	Age.	Duration of Symptoms.	Height of Disease from Anus.	Treatment.	Result.		Remarks.
								Immediate.	Secondary.	
131	1893 Feb.	Harrison Cripps	M.	70	1½ years	High up	Colotomy	—	—	
132	1893 Feb.	Dr. Percival (Northampton)	M.	57	8 months	2 inches	Excision	Recovery	Recurred	Patient lived 13 months.
133	1893 Feb.	Dr. Lowe	M.	58	14 months	3 inches	Excision	Recovery	Recurred	Patient lived 3 years. The disease had invaded the prostate, in which position it recurred.
134	1893 Mar.	Dr. Reynolds	F.	48	1 year	1½ inches	Excision Colotomy	Recovery	Recurred	Recurred in 15 months; colotomy; patient lived 2½ years.
135	1893 May	Dr. Wilkes	F.	65	14 months	5 inches	Palliative	—	—	Lived 11 months.
136	1893 May	Dr. Fulcher	F.	45	Not stated	3 inches	Colotomy	Death	—	The patient had had complete obstruction for 11 days, with faecal vomiting; death on 4th day: abdomen full of secondary deposits.
137	1893 May	Dr. Hobday	M.	43	18 months	2 inches	Palliative		—	Lived 5 months.

138	1893 June	Dr. Thompson	M.	70	18 months	3½ inches	Colotomy	Recovery	—	Lived 5 months. The disease was very advanced, causing obstruction.
139	1893 June	Harrison Cripps	F.	55	15 months	4 inches	Palliative	—	—	Lived 4 months.
140	1893 July	Dr. Randwick	M.	61	9 months	Junction of sigmoid with rectum	Colotomy	Recovery	—	Transverse colotomy.
141	1893 Aug.	Dr. Steggall	F.	60	Over a year	4 inches	Refused	—	—	Lived 7 months.
142	1893 Sept.	Dr. Buller	M.	70	8 months	5 inches	Refused	—	—	Lived 1 month. Died with fecal vomiting and other signs of complete obstruction.
143	1893 Sept.	Dr. Wade	M.	60	15 months	2½ inches	Excision Colotomy	Recovery	Recurred	Lived 4 years. Sacrum partly removed; recurred in 18 months; colotomy. Patient remained in active work as a surveyor till within 3 months of his death.
144	1893 Oct.	Dr. Turner (Annesley)	M.	53	14 months	4½ inches	Excision	Recovery	—	Lived 16 months; died with secondary deposits in liver; no local recurrence.
145	1893 Oct.	Dr. Turner	M.	48	10 months	5 inches	Colotomy	Recovery	—	Lived 2 years 8 months.



Number.	Date.	Medical Attendant.	Sex.	Age.	Duration of Symptoms.	Height of Disease from Anus.	Treatment.	Result.		Remarks.
								Immediate.	Secondary.	
146	1893 Nov.	Dr. Broadbent	M.	65	9 months	5 inches	Colotomy (complete obstruction)	Death	—	Had seen patient five weeks previously and urged a colotomy, which was refused. On seeing this patient the second time, abdomen enormously distended; complete obstruction 13 days; fecal vomiting. On opening the abdomen a large amount of fetid gas escaped; the actual perforation could not be found. Death on 6th day.
147	1893 Nov.	Dr. Macdonald	M.	64	1 year	2 inches	Excision	Recovery	—	The last 3½ inches of the rectum completely removed; subsequent history not traced.
148	1893 Nov.	Dr. Carless	M.	54	6 months	4 inches	Excision	Recovery	Well 5 years	Died suddenly of heart disease 5 years after operation; no recurrence.
149	1893 Dec.	Sir Lauder Brunton	F.	60	6 months	3½ inches	Excision	Death	—	The disease extended very high; peritoneal cavity extensively opened; death on 4th day, probably from peritonitis; no post-mortem.

150	1894 Jan.	Dr. Swift	M.	69	9 months	4 inches	Refused	—	—	Obstruction complete 7 days ; operation very difficult, owing to enormous fatness of patient, taking over an hour ; death in 24 hours.
151	1894 Jan.	Mr. Christopher Heath	M.	70	18 months	1 inch	Colotomy	Death	—	Lived 3 months.
152	1894 Feb.	Dr. Chambers	F.	69	2 years	3 inches	Palliative	—	—	Lived 7 months.
153	1894 Feb.	Dr. Jukes (Horsham)	M.	71	18 months	4½ inches	Palliative	—	—	Lived nearly 3 years.
154	1894 Feb.	Harrison Cripps	M.	62	9 months	3¼ inches	Colotomy	Recovery	—	
155	1894 Feb.	Dr. Carless (Devonshire)	M.	38	8 months	2 inches	Excision	Recovery	Not stated	
156	1894 Feb.	Dr. Irving	M.	42	1 year	5½ inches	Colotomy	Recovery	—	
157	1894 Mar.	Dr. Lang	M.	60	2 years	3 inches	Palliative	—	—	
158	1894 Mar.	Dr. Connor	M.	60	14 months	1 inch	Excision	Recovery	Recurred	
159	1894 Apr.	Dr. Maurice (Reading)	M.	62	18 months	4 inches	Colotomy	Recovery	—	Advised an excision, but curiously enough for some reason refused,

Number.	Date.	Medical Attendant.	Sex.	Age.	Duration of Symptoms.	Height of Disease from Anus.	Treatment.	Results.		Remarks.
								Immediate.	Secondary.	
160	1894 May	Dr. Jones King			Not known	3 inches	Refused	—	—	and requested a colotomy. Dr. Maurice writes: "Our patient lived 3 years after the colotomy. He suffered very little, and till the last few months scarcely looked ill."
161	1894 May	Dr. Hoyland	F.	68	4 months	3 inches	Refused	—	—	
162	1894 May	Dr. Baines (Toronto)		40	2 years	2 inches	Colotomy	Recovery	—	
163	1894 June	Dr. Kane	M.		14 months	5 inches	Palliative	—	—	Over 2 years. The patient's father called 2 years after the operation, saying "his son enjoyed excellent health, and attended to business daily." 11 months.
164		Mr. Browne	M.	52	1 year	4 inches	Colotomy	Recovery	—	Lived 2 years.
165		Dr. Parsons	F.	61	2 years	3 inches	Palliative	—	—	Lived 7 months.

166		Harrison Cripps	F.	50	4 months	2 inches	Palliative	—	—	Lived 5 months. Patient very fat and confirmed dipsomaniac.
167	1894 July	Dr. Philpots	M.	40	5 months	4 inches	Excision Colotomy	Recovery	Recurred	Lived 18 months. Unfortunately the patient neglected the bougie, and 6 months after the operation he had complete obstruction. Colotomy performed, and death took place 1 year later.
168	1894	Harrison Cripps	M.	45	Not stated	6 inches	Palliative	—	—	Lived 4 months.
169	1894 Aug.	Dr. Musson	M.	50	6 months	4 inches	Colotomy	Recovery	—	Lived 2 years. Patient lived in comparative comfort. A year after the operation he was able to enjoy salmon fishing and spent his days wading.
170	1894 Aug.	Dr. Roberts (Deal)	M.	52	2 months	4 inches	Colotomy	Recovery	—	Died with large secondary deposits in the liver 6 months after colotomy.
171	1894 Aug.	Dr. Tanner	M.	47	18 months	3½ inches	Palliative	—	—	—
172	1894 Aug.	Dr. Adams	M.	70	2 years	3 inches	Palliative	—	—	Lived 3 months.
173	1894 Aug.	Dr. Saunders	M.	50	9 months	4½ inches	Palliative	—	—	

Number.	Date.	Medical Attendant.	Sex.	Age.	Duration of Symptoms.	Height of Disease from Anus.	Treatment.	Result.		Remarks.
								Immediate.	Secondary.	
174	1894 Sept.	Harrison Cripps	F.	50	Not stated	4 inches	Excision	Not stated	—	
175	1894 Oct.	Dr. Ludwig	M.	42	1 year	3 inches	Colotomy	Recovery	—	Lived 15 months.
176	1894 Oct.	Dr. Eden	M.	64	9 months	High up	Palliative	—	—	Lived 20 months.
177	1894 Oct.	—	M.	56	Not stated	1 inch	Palliative	—	—	Lived 4 months.
178	1894 Oct.	Dr. Cropley (Northampton)	M.	51	12 months	2 inches	Colotomy	Recovery	—	Lived 13 months.
179	1894 Oct.	Dr. Jones (Sutherland Crescent)	M.	71	10 months	3½ inches	Palliative	—	—	Lived 8 months.
180	1894 Dec.	Dr. Miller	M.	60	8 months	3 inches	Colotomy	Recovery	—	Lived 22 months; 18 inches of sigmoid removed at the colotomy operation.
181	1895 Jan.	Dr. Miller	F.	73	Not stated	High up	Colotomy	—	—	Lived 27 months. Dr. Miller states that the colotomy opening acted well and gave little trouble.

182	1895	Dr. Telfer	F.	65	7 months	3½ inches	Palliative	—	—	Lived 7 months.
183	1895 Feb.	Dr. Hearnden	F.	60	14 months	High up	Palliative	—	—	Colotomy ultimately performed by another surgeon.
184	1895 Mar.	Dr. Buchanan (Coleford)	F.	50	5 months	5 inches	Colotomy	Recovery	—	Lived 2 years 9 months.
185	1895 Mar.	Dr. Campbell	M.	40	18 months	4 inches	Palliative	—	—	Lived 24 hours. This patient had complete obstruction for 10 days. Saw the patient when too late for any operation.
186	1895 Apr.	Dr. Martin	M.	50	Not stated	3 inches	Palliative	—	—	Complete obstruction ; fecal vomiting ; lived 8 months.
187	1895 Apr.	Dr. Hewer	F.	30	Not stated	High up	Colotomy	Recovery	—	Complete obstruction ; fecal vomiting ; lived 8 months.
188	1895 May	Mr. Lawson Tait	F.	44	6 months	3 inches	Excision	Recovery	Well 1 year	Unable to trace this patient, but was well a year after operation. Six weeks previous to my excision Mr. Lawson Tait had done a lumbar colotomy. The disease was anterior, but there was no obstruction. About 4½ inches of the bowel removed.
189	1895 May	Mr. Jones (Manchester)	M.	47	13 months	3 inches	Excision Colotomy	Recovery	Recurred	Portion of sacrum removed ; recurred in 6 months ; a colotomy ; patient lived 10 months.

Number.	Date.	Medical Attendant.	Sex.	Age.	Duration of Symptoms.	Height of Disease from Anus.	Treatment.	Result.		Remarks.
								Immediate.	Secondary.	
190	1895 May	Dr. Aldous (Plymouth)	M.	65	24 months	4½ inches	Excision Colotomy	Recovery	Recurred	Lived 2 years 3 months. Portion of sacrum removed; recurred in 6 months; colotomy; 12 inches of sigmoid removed. Patient lived in fair comfort for 19 months.
191		Dr. Wishaw	F.	64	9 months	High up	Colotomy	Death	—	There was practically no mesentery; stitches very tight, and gave way; death 5th day.
192	1895	Dr. Lowe (Burton)	M.	42	6 months	3 inches	Excision	Recovery	Well 11 years	The disease commenced at three inches and surrounded the bowel for three inches, producing much stricture. The coccyx was removed, and the disease, adenoid cancer, very thoroughly excised. In January 1906, I examined the bowel. At two inches from the anus was a slight contraction, but No. 9 bougie passed easily. There was no sign of any disease, all the parts being soft and supple and moved freely on the surrounding parts. Has

# CASES OF RECTAL CANCER

215

very good control, except in diarrhoea; continued his work as a general medical practitioner ever since the operation.

Lived 7 months.

The disease was high and the operation difficult. After removing the disease a dense hard band like an infected lymphatic could be felt running up into the pelvis outside rectal wall behind. Its sections, however, looked like fibrous tissue only; growth, adenoid cancer; microscope. November 1905, saw patient to-day; parts quite supple; fair control; no sign of recurrence. Used bougie for 5 years.

Owing to Dr. Lucas's disease have been unable to obtain authentic further history.

The sigmoid made a loop 12 inches long outside the wound.

193	1895	Dr. Brodie	M.	70	1 year	High up	Palliative	—	—	
194	1895 July	Dr. Robinson (Norwich)	F.	38	18 months	4 inches	Excision	—	Well 10 years	
195	1895 Aug.	Dr. Murphy	M.	40	3 years	4½ inches	Colotomy	Recovery	—	
196		Dr. Lucas (Newark)	M.	40	3 months	2 inches	Excision	Recovery	Well 5 years.	
197		Dr. Spilsbury	M.	52	Not stated	4½ inches	Colotomy	Recovery	—	



Number.	Date.	Medical Attendant.	Sex.	Age.	Duration of Symptoms.	Height of Disease from Anus.	Treatment.	Result.		Remarks.
								Immediate.	Secondary.	
198	1895 Sept.	Dr. Thompson	F.	50	Not stated	4 inches	Refused	—	—	It was tightly distended with faeces. This was let out by an incision and then the cut temporarily sewn up.
199	1895 Sept.	Dr. Corbould	M.	55	8 months	5½ inches	Palliative	—	—	
200	1895 Sept.	Harrison Cripps	M.	60	Not stated	High up	Palliative	—	—	
201	1895 Sept.	Dr. Brumell (Morpeth)	M.	42	12 months	4 inches	Colotomy	Recovery	—	
202	1895 Sept.	Dr. Ford-Anderson	M.	75	5 months	1 inch	Colotomy	Death	—	Complete obstruction for 13 days; faecal vomiting; belly enormously distended; death 48 hours.
203	1895 Sept.	Not stated	F.	60	12 months	3 inches	Excision	Recovery	Well 1 year	Subsequent history not traced.

204	1895 Nov.	Dr. Kidd	F.	49	14 months	4½ inches	Refused	—	—	Lived in fair comfort 15 months.
205	1895 Nov.	Dr. Hind (Jersey)	M.	75	9 months	3 inches	Colotomy	Recovery	—	Lived 7 months.
206	1895 Nov.	Dr. Swindell	F.	82	1 year	2 inches	Palliative	—	—	Lived 9 months.
207	1895 Nov.	Dr. Baird	M.	60	Not stated	4 inches	Palliative	—	—	Patient five months pregnant. Obstruction complete; colotomy; four months later delivered of healthy baby. Mother died 4 days after labour.
208	1896 Jan.	Dr. Belby	F.	51	9 months	1 inch	Palliative	—	—	Lived 2 months.
209	1896	Dr. Champneys	F.	42	8 months	4 inches	Colotomy	—	—	Complete obstruction. Two months previously the patient had been urged by Mr. Jones,
210	1896	Sir W. Roberts	M.	50	10 months	3½ inches	Palliative	Recovery	—	
211	1896 Feb.	Dr. Woodfield	M.	56	18 months	4½ inches	Refused	—	—	
212	1896 Feb.	Dr. Scott	F.	35	14 months	5 inches	Colotomy	Recovery	—	
213	1896 Mar.	Dr. Davies	M.	48	19 months	4 inches	Colotomy	Death	—	

## CASES OF RECTAL CANCER

Number.	Date.	Medical Attendant.	Sex.	Age.	Duration of Symptoms.	Height of Disease from Anus.	Treatment.	Result.		Remarks.
								Immediate.	Secondary.	
214	1896 Mar.	Sir Lauder Brunton	M.	—	1 year	5 inches	Palliative	—	—	Lived 4 months.
215	1896 Mar.	Dr. Knowles (Maidstone)	F.	60	14 months	4 inches	Colotomy	Recovery	—	Lived 4 months. Operation difficult; bowel bound down by secondary deposits between. Nodules all over peritoneum; death from perforation.
216	1896 Apr.	Dr. Hardy	M.	47	2 years	2½ inches	Excision	Recovery	—	Patient died 4 months after the operation from a sudden violent hæmorrhage from rectum. No

217	1896 Apr.	Harrison Cripps	F.	82	1½ years	High up	Colotomy	Recovery	—	Lived 4 years. This patient had nearly complete obstruction; recovered remarkably well from the colotomy, and lived in comfort 4 years. Death took place quite suddenly from syncope; an hour before she was in good health.
218	1896 Apr.	Dr. Hutchinson (Birmingham)	M.	61	6 months	3 inches	Excision	Recovery	Well 10 years	This case was seen in consultation with Mr. Jordan Lloyd. The disease was high, and there was some doubt whether it could be removed. The end of sacrum removed; five inches of the bowel taken away, the peritoneum being freely opened. The operation was difficult, but patient did well. He is now in excellent health, and never had any trouble since the operation. Has very good control. Microscope: adenoid cancer.
219	1896 Apr.	Dr. Miller (Forest Gate)	M.	70	Not mentioned	3 inches	Palliative	—	—	Lived 4 months.

Number.	Date.	Medical Attendant.	Sex.	Age.	Duration of Symptoms.	Height of Disease from Anus.	Treatment.	Result.		Remarks.
								Immediate.	Secondary.	
220	1896 April	Dr. Adams (E.C.)	M.	55	18 months	High up	Palliative	—	—	Lived 6 months.
221	1896 May	Dr. Prosser	M.	60	18 months	4 inches	Refused	—	—	Lived 7 months.
222	1896 May	Dr. Watt Black	F.	51	12 months	4 inches	Colotomy Excision	Recovery	—	Lived 3½ years. At the colotomy the sigmoid was remarkably long and movable. Before stitching the bowel two feet of it was excised. Excision performed a month later. She died at Rio 3½ years later without local recurrence.
223	1896 May	Dr. Hallows	M.	65	Not stated	High up	Refused	—	—	Lived 3 months.
224	1896 May	Mr. Reid	F.	68	10 months	4 inches	Colotomy	—	—	Nearly complete obstruction.
225	1896 June	Dr. Parsons	F.	74	Not stated	3½ inches	Palliative	—	—	
226	1896 June	Dr. Rowel	M.	58	9 months	4½ inches	Colotomy	Recovery	—	Lived 2 years.

# CASES OF RECTAL CANCER

221

227	1896 June	Harrison Cripps	F.	61	Not stated	High up	Palliative	—	—	Lived 7 months.
228	1896 July	Dr. Applebe (Winchester)	M.	65	9 months	High up	Refused	—	—	
229	1896 July	Dr. Holland	M.	60	18 months	4 inches	Palliative	—	—	
230	1896 July	Dr. Stanley Smith	M.	55	11 months	3 inches	Colotomy	Recovery	—	Lived 5 months.
231	1896 Nov.	Not stated	M.	60	18 months	1 inch	Refused	—	—	
232	1896 Nov.	Dr. Lowsley	M.	60	1 year	High up	Colotomy	Death 5th day		Complete obstruction 12 days ; fecal vomiting and hiccup ; sigmoid stitched to the skin and opened ; large washing basin of fluid faeces evacuated. Patient never recovered from his desperate condition, and died on 5th day.
233	1896 Dec.	Dr. Shaw (Cambridge)	M.	63	4 months	4 inches	Excision	Recovery	Recurred	Lived 11 months. The disease was very adherent, and the operation not a satisfactory one.
234	1896 Dec.	Harrison Cripps	M.	62	Not stated	2½ inches	Excision	Recovery	—	Posterior two-thirds of the bowel removed, 4½ inches in length.

Number.	Date.	Medical Attendant.	Sex.	Age.	Duration of Symptoms.	Height of Disease from Anus.	Treatment.	Result.		Remarks.
								Immediate.	Secondary.	
235	1897 Jan.	Dr. Jamison	M.	30	3 months	2½ inches	Excision	Recovery	Well 9 years	On the anterior wall at a distance of 2½ inches was a hard indurated ulcer the size of a five-shilling-piece. In the sub-rectal tissue a little way from the growth was a gland the size of a nut. Both growth and gland very freely removed. November 1905.—Patient has never had any recurrence; is quite well, with good control.
236	1897 Jan.	Harrison Cripps	M.	70	Not stated	5 inches	Colotomy	—	—	Lived 3 months. The patient had a rodent ulcer of six years' standing on the face.
237	1897 Feb.	Dr. Batten (Gloucester)	M.	55	Not stated	High up	Colotomy	Recovery	—	Lived nearly 2 years. Sigmoid very redundant; twelve inches removed.
238	1897 Feb.	Dr. Wigmore	F.	70	Over a year	3 inches	Colotomy	Recovery	—	Ten inches of sigmoid removed.
239	1897 Mar.	Dr. Miller	M.	77	18 months	Not stated	Colotomy	Death	—	Operation done for complete obstruction; death on 3rd day.

# CASES OF RECTAL CANCER

223

240	1897 Mar.	Dr. Shaw	M.	62	Not stated	High up	Colotomy	Recovery	—	Living and in fair health 3½ year later.
241	1897 Mar	Dr. Hastings	M.	71	8 months	5 inches	Colotomy	Recovery	—	Lived 10 months.
242	1897 Apr.	Dr. Budd]	M.	56	16 months	3½ inches	Excision	Recovery	Recurred	The removal was not satisfactory at the operation, the disease having spread into the surrounding tissue. The patient, however, who was a medical man, was anxious an attempt should be made. Death in 10 months.
243	1897 Apr.	Dr. Paradise	M.		1 year	4 inches	Colotomy	Recovery	—	Lived 26 months.
244	1897 Apr.	Not stated	F.	65	10 months	3 inches	Refused	—		
245	1897 May	Dr. Lee (Thame)	M.	54	15 months	4 inches	Colotomy	Recovery	—	Lived 19 months.
246	1897 May	Dr. Hargreaves	F.	65	Not stated	4½ inches	Colotomy	Recovery	—	
247	1897 May	Harrison Cripps	M.	75	14 months	High up	Palliative	—	—	Lived 1 year.
248	1897 June	Dr. Sadlier	F.	64	1 year	3 inches	Colotomy	Recovery	—	Lived 5 months. Dr. Sadlier writes that "she had no pain after the colotomy."



## CASES OF RECTAL CANCER

Number.	Date.	Medical Attendant.	Sex.	Age.	Duration of Symptoms.	Height of Disease from Anus.	Treatment.	Result.		Remarks.
								Immediate.	Secondary.	
249	1897 June	Mr. Wells	F.	48	10 months	High up	Palliative	—	—	
250	1897 July	Dr. Trechmann	M.	60	11 months	3 inches	Palliative	—	—	
251	1897 July	Dr. Miller	M.	49	10 months	4½ inches	Colotomy	Recovery	—	Lived 18 months.
252	1897 Aug.	Dr. Saunders	F.	60	Not stated	High up	Colotomy	Recovery	—	Lived 2 years (?)
253	1897 Sept.	Harrison Crippes	M.	51	2 years	4 inches	Palliative	—	—	Lived 4 months.
254	1897 Sept.	Dr. Bedford	F.	70	Not stated	High up	Palliative	—	—	Lived 7 months.
255	1897 Sept.	Sir Thomas Barlow	M.	67	9 months	4 inches	Excision	Recovery	Well 9 years	Disease situated 4 inches up the bowel. At first examination finger could not pass beyond it. At a second examination under ether, Sir Thomas Smith and Mr. A. Willett being present, the finger, with some difficulty, was passed beyond.

The bowel was fairly movable; there was much stricture, which would only admit the forefinger. There being some divergence of opinion as to the possibility of operating, the patient decided to have it done. Assisted by Mr. Lockwood, after removing  $1\frac{1}{4}$  inches of the sacrum, five inches of the bowel were excised. Microscope: adenoid cancer. The section was only just free of the disease. Patient did well. For 2 years there was a great tendency for the part to contract, but was kept open by the daily use of a bougie. January 1906.—Patient in good health; has some prolapsus, but fair control. No stricture, and part absolutely sound.

Obstruction complete 9 days; fecal vomiting for 2 days; abdomen enormously distended and tympanitic. On opening the abdomen a loop of large intestine three feet long and distended to three inches in diameter protruded; the whole of this excised. Patient died on 8th day.

256

1897  
Sept.

Dr. Fletcher

M.

70

Not stated

4 inches

Colotomy

Death

—

Number.	Date.	Medical Attendant.	Sex.	Age.	Duration of Symptoms.	Height of Disease from Anus.	Treatment.	Result.		Remarks.
								Immediate.	Secondary.	
257		Harrison Cripps	M.	30	1 year	4 inches	Colotomy	Recovery	—	Lived in fair comfort for 3 years.
258		Dr. Hawes	M.	60	8 months	5 inches	Colotomy	Recovery	—	Much tension on bowel when stitched. On fifth day after a violent cough the stitches gave way. Along the upper line some small intestines protruded. Washed and re-stitched; six days later, after coughing, union again gave way, a large mass of omentum protruding. This being much bruised and soiled with motion was tied and cut off. The protruding coils of small intestine washed and restitched. Eight silk gut sutures were passed, going through the whole thickness of the abdominal walls and including the cut edge of the omentum. After this the patient did well, and lived over 2 years.
259	1897 Dec.	Not stated	F.	60	14 months	2 inches	Refused	—	—	

260	1897 Dec.	Dr. Plumbo	M.	65	15 months	High up	Colotomy	Recovery	—	Complete obstruction 8 days. Lived 1 year 7 months; opened at once.
261	1898 Jan.	Dr. Knowles	M.	61	Not stated	2 inches	Colotomy	Recovery	—	Complete obstruction 14 days. Lived 1 year.
262	1898 Feb.	Dr. E. Smith	M.	74	2 years	3 inches	Colotomy	Recovery	—	Complete obstruction 9 days. Opened at once; lived 18 months.
263	1898 Feb.	Dr. Rushworth	F.	62	14 months	4 inches	Excision	Recovery	Well 8 years	Sacrum sawn across high up; four inches of bowel excised; last three inches of the bowel and anus left intact. Peritoneum opened. Ends of cut bowel could not be drawn together; upper end brought out and fixed in upper part of wound. Two years later a careful examination showed no recur- rence, but the upper end of bowel prolapsing about three inches. The two ends were then freed from the surround- ing tissue and joined together by an end to end anastomosis. The result was excellent. The ends united without stricture, and she regained perfect con- trol. January 1906.—Still quite well, no sign of recurrence.

Number.	Date.	Medical Attendant.	Sex.	Age.	Duration of Symptoms.	Height of Disease from Anus.	Treatment.	Result.		Remarks.
								Immediate.	Secondary.	
264	1898 Mar.	Dr. McLagan Dr. Fuller	F.	74	18 months	3½ inches	Colotomy	Recovery	—	Lived 8½ years. Dr. Fuller writes, under date of May 24, 1906: "Miss S. passed very little motion the last 2 days; gradually became unconscious, and died this evening. I should think the case almost a record in life duration after inguinal colotomy for malignant disease."
265	1898 Apr.	Dr. Batten	M.	68	Not stated	High up	Colotomy	Recovery	—	Lived 2 years.
266	1898 May	Dr. Taylor	F.	40	18 months	2 inches	Excision	Recovery	Well for 6 years	Sacrum cut across. Patient did well for 3 weeks, when she had a sudden discharge of urine from upper part of wound. For the next fortnight about half the whole urine came away by the wound. No opening could be found after repeated examination. It then gradually ceased, and a month later she passed all her water the natural way. Had no trouble for 7 years, when she

267	1898 July	Dr. — (Swan Creek, Australia)	M.	45	18 months	4 inches	Colotomy	Recovery	—	died with signs of internal cancer.  Fourteen inches of sigmoid re- moved; ends accidentally re- versed, so that motion passed through lower opening.
268	1898 July	Harrison Cripps	F.	54	Not stated	2 inches	Excision	Recovery	Well 4 years	Well 4 years later.
269	1898 July	Dr. Kinneir	F.	71	Not stated	4 inches	Colotomy	Death	—	Complete obstruction for 10 days; fecal vomiting for 3 days; enormous distension. A large washing basin of fluid feces let out. Death 24 hours.
270	1898 Sept.	Mr. Bird	F.	40	2 years	1 inch	Palliative	—	—	
271	1898 Aug.	Harrison Cripps	M.	45	15 months	2 inches	Refused	—	—	
272	1898 Sept.	Dr. Roche	F.	64	18 months	3 inches	Colotomy	Death	—	Obstruction considerable, but not complete. Much small intes- tine protruded at the operation. Constant vomiting continued after the operation, and she died on the sixth day. Dr. Roche kindly made a p.m. and found a piece of small intestine, apparently caught down in

Number.	Date.	Medical Attendant.	Sex.	Age.	Duration of Symptoms.	Height of Disease from Anus.	Treatment.	Result.		Remarks.
								Immediate.	Secondary.	
273	1898 Nov.	Dr. Connor	M.	53	Not stated	3 inches	Refused	—	—	Douglas's pouch, kinked; it required a considerable effort to pull it out. It was obviously the cause of the vomiting; no peritonitis.
274	1898 Nov.	Dr. Carr	M.	61	14 months	2½ inches	Refused	—	—	An operation was subsequently performed by another surgeon, who failing to find the sigmoid, opened the cæcum.
275	1898 Dec.	Dr. Boutflower	M.	49	9 months	3 inches	Excision Colotomy	Recovery	Recurred	4½ inches of the bowel excised. Recurrence 10 months; colotomy. Lived 18 months.
276		Harrison Cripps	M.	71	Not stated	High up	Palliative	—	—	Symptoms suggested malignant stricture of rectum. Careful examination by myself and Sir F. Treves failed to touch any growth. At a subsequent examination under ether a
277		Mr. Ball	M.	50	6 months	6 inches	Palliative	—	—	

278	1899 Jan.	Dr. Taylor	F.	55	2 years	3 inches	Palliative	—	—	Lived 4 months.	malignant stricture could be clearly felt at nearly 6 inches up.
279	1899 Jan.	Dr. Collins	M.	64	Not stated	2 inches	Excision	Recovery	—	The operation was not a satisfactory one, the section being very near the growth, and probably some disease left. Subsequent history not followed.	
280	1899 Jan.	Dr. Ford Anderson	F.	81	2 years	2 inches	Colotomy	Recovery	—	Obstruction nearly complete. The old lady lived nearly 3 years in comfort and never had any pain.	
281	1899 Jan.	Mr. Davis	M.	48	8 months	4 inches	Colotomy	Recovery	—	Lived 15 months.	
282	1899 Feb.	Harrison Cripps	M.	60	8 months	5 inches	Colotomy	Recovery	—		
283	1899 Feb.	—	M.	70	1 year	3 inches	Palliative	—	—		
284	1899 Mar.	Dr. Ford Anderson	M.	70	14 months	5 inches	Colotomy	Recovery	—	Lived 22 months. From the fourth to seventh day after the operation patient suffered from constant delirium and was rapidly	



Number.	Date.	Medical Attendant.	Sex.	Age.	Duration of Symptoms.	Height of Disease from Anus.	Treatment.	Result.		Remarks.
								Immediate.	Secondary.	
285	1899 Mar.	Dr. Paterson	F.	45	8 months	4½ inches	Excision	Recovery	Recurred	going down hill. After being got out of bed and seated in a chair the delirium almost at once disappeared. Recurred after 2 years. Died a year later.
286	1899 Apr.	Harrison Cripps	M.	63	8 months	2 inches	Excision	Recovery	Recurred	Recurred in 8 months.
287	1899 Apr.	Not stated	M.	71	18 months	4 inches	Palliative	—	—	Death 4 months.
288	1899 Apr.	Dr. Williamson	M.	64	10 months	3 inches	Excision Colotomy	Recovery	Recurred	Disease returned in 9 months. Colotomy; death 1 year 9 months later.
289	1899 May	Dr. T. Griffiths	F.	53	5 months	1½ inches	Excision	Recovery	Well 4 years	A circular ulcerated patch 1½ inches in diameter on posterior wall. Alive 4 years later.
290	1899 May	Mr. Percival	M.	58	7 months	2 inches	Excision	Recovery	Well 7 years	Alive 7 years. In this case the disease was confined to the left half of the rectum, commencing at two inches and

measured  $1\frac{1}{2}$  in. wide by 2 long, deeply ulcerated. Mr. Percival writes, under date of June 19, 1906: "Mr. T. is alive and quite well. There has been no recurrence."

Very long sigmoid, two feet being removed at time of operation. Lived over 2 years.

The disease commenced at three inches and involved two inches of the bowel. The bowel was excised after removing a portion of the sacrum. The disease recurred in 4 months, and she died a few months later.

Lived 5 months.

Lived 18 months.

291	1899 May	Dr. Gimson	M.	70	3 months	High up	Colotomy	Recovery	—	
292	1899 May	Harrison Cripps	F.	40	2 years	3 inches	Excision	Recovery	Recurred	
293	1899 May	Dr. Taylor	F.	50	18 months	High up	Palliative	—	—	
294	1899 Aug.	Dr. Bott	M.	47	1 year	4 inches	Colotomy	Recovery	—	
295	1899 Aug.	Not stated	M.	70	14 months	High up	Refused	—	—	
296	1899 Sept.	Harrison Cripps	M.	54	Not stated	3 inches	Refused	—	—	

Number.	Date.	Medical Attendant.	Sex.	Age.	Duration of Symptoms.	Height of Disease from Anus.	Treatment.	Result.		Remarks.
								Immediate.	Secondary.	
297	1899 Sept.	Mr. Allingham	F.	48	Not stated	Anus	—	—	—	This patient was operated upon two years previously by Mr. Allingham. A very small local recurrence, which was again removed.
298	1899 Nov.	Dr. Dingle	M.	38	18 months	2½ inches	Refused	—	—	
299	1899 Nov.	Harrison Cripps	M.	70	10 months	2 inches	Excision	Recovery	Well 3 years	The disease commenced at 2 inches and extended upwards about 3 inches. Sacrum sawn through and bowel excised, the anus being left. Patient was free from recurrence 3 years after operation, but died a year later. Cause of death not stated.
300	1899 Dec.	Dr. Beadles	F.	60	18 months	4 inches	Colotomy	Recovery	—	Obstruction complete with vomiting. Patient lived 26 months after the colotomy.
301	1899 Dec.	Dr. Evans (Goring)	M.	61	4 months	1½ inches	Excision	Recovery	Well 6 years	This was a patch of adenoid cancer 1½ inches in diameter. Ulcerated on surface with hard

crater-like edges. Excised with a free margin. Dr. Evans writes, under date January 1906: "Mr. S. is alive and most robust; attends to business, and takes the chair at political meetings."

This patient had had a polypus removed six years previously, now an area of cancer two inches in diameter.

This patient nearly died of recurrent hæmorrhage. Bowel opened on ninth day, a considerable amount of superfluous bowel being removed. Forty-eight hours later a violent hæmorrhage from both the wound and the rectum, 40 to 503 being lost. The source of the blood was doubtful, but was arrested by transfusing deeply, the mesenteric stump showing in the wound. Patient lived 15 months.

The disease was very adherent, and the excision not satis-

302	1900 Jan.	Dr. Reynolds	F.	50	6 months	1 inch	Refused	—	—	
303	1900 Jan.	Mr. Christopher Heath	M.	62	8 months	High up	Not stated	—	—	
304	1900 Jan.	Dr. Maclean	M.	63	2 years	4 inches	Colotomy	Recovery	—	
305	1900 Mar.	Dr. Atkin	M.	60	10 months	2 inches	Excision Colotomy	Recovery	Recurred	

## CASES OF RECTAL CANCER

Number.	Date.	Medical Attendant.	Sex.	Age.	Duration of Symptoms.	Height of Disease from Anus.	Treatment.	Result.		Remarks.
								Immediate.	Secondary.	
306	1900 Mar.	Dr. Curgenven	M.	38	16 months	5 inches	Colotomy	Recovery	—	factory. Recurred in 8 months; a colotomy, after which the patient lived 9 months.
307	1900 May	Not stated	M.	40	1 year	High up	Palliative	—	—	Dr. Curgenven writes: "This patient lived in comfort for 19 months, and derived great benefit from the operation."
308	1900 May	Dr. Thomas	M.	50	16 months	2½ inches	Palliative	—	—	
309	1900 May	Dr. Bull	M.	70	18 months	3 inches	Colotomy	Recovery	—	Lived 17 months. Bowel could not be drawn up till the external layer of the meso-sigmoid was divided: it then came up readily.
310	1900 May	Harrison Cripps	M.	60	11 months	High up	Colotomy	Recovery	—	Did well after the operation. Died from hæmorrhage from the growth 2 months later.

311	1900 May	Harrison Cripps	M.	34	Not stated	4 inches	Colotomy	Recovery	—	—	• This growth had a wide indurated pedicle; it was freely removed, cutting out an area of the bowel two inches in diameter, including the peritoneum. This patient was still quite well in 1905.
312	1900 May	C. F. (of Carlisle)	F.	60	2 years	4½ inches	Excision	Recovery	Well 5 years	Well 5 years	Well 6 years. The growth was in the form of a ring surrounding the bowel at 3½ inches; stricture would only admit finger-tip. Growth, including whole thickness of bowel, excised and ends joined. Dr. Scott writes, under date Jan. 1906: "Patient remained in excellent health; no recurrence; has put on two stone in weight."
313	1900 June	Dr. Scott (Bournemouth)	F.	50	10 months	3½ inches	Excision	Recovery	Well 5 years	Well 5 years	Anterior half of the bowel for 4 inches removed. Made a good recovery. Death in 1½ years, without local recurrence.
314	1900 July	Dr. Blake	M.	81	1 year	2½ inches	Excision	Recovery	—	—	
315	1900 Aug.	Mr. Heaton	M.	60	2 years	2½ inches	Refused	—	—	—	

Number.	Date.	Medical Attendant.	Sex.	Age.	Duration of Symptoms.	Height of Disease from Anus.	Treatment.	Result.		Remarks.
								Immediate.	Secondary.	
316	1900 Aug.	Harrison Cripps	M.	60	18 months		Palliative	—		This patient had colotomy performed by another surgeon 15 months previously for complete obstruction.
317	1900 Aug.	Dr. Rattray	M.	40	18 months	2 inches	Colotomy	Death	—	Complete obstruction for 10 days with great distension and fecal vomiting. Death in 24 hours.
318	1900 Aug.	Dr. Chittingdon	M.	72	Advanced	2 inches	Colotomy	Recovery	—	Patient lived 17 months.
319	1900 Nov.	Dr. Queenall	F.	60	2 years	Pelvis blocked	Refused	—	—	
320	1900 Nov.	Dr. Stokes	M.	21	6 months	3 inches	Excision	Recovery	Well 5 years	The growth on left and anterior wall occupied an area of 1½ inches diameter; whole thickness of rectal wall excised. Dr. Stokes writes, January 1906: "There has been no recurrence."
321	1900 Nov.	Dr. Miller (Forest Gate)	F.	29	12 months	3½ inches	Colotomy	Recovery	—	

322	1900 Nov.	Not stated	M.	51	15 months	Pelvis blocked	Refused	—	—	Lower third of sacrum removed. Recurrence in 8 months ; death in few months.
323	1900 Dec.	Dr. Stanley Smith	M.	67	8 months	5½ inches	Excision	Recovery	Recurred	
324	1901	Harrison Cripps	M.	30	7 months	3½ inches	Palliative	—	—	
325	1901 Jan.	Harrison Cripps	M.	42	5 months	1 inch	Excision	Recovery	Well 5 years	Growth involving an area the size of a florin on posterior wall close to the anus.
326	1901 Jan.	Dr. Morrison	M.	40	1 year	2 inches	Excision	Recovery	—	Sacrum sawn across and a good view obtained, four inches of bowel being removed. A strip of mucous membrane left in front. Died suddenly a year later from accident ; no recur- rence.
327	1901 Mar.	Dr. Elliott	M.	72	10 months	2½ inches	Excision	Recovery	Well 3 years	Alive 5 years. Growth covered an area about two inches in diameter ; bowel moved freely. Dr. Elliott writes, May 1906 : "The patient never had any local trouble nor sign of recur- rence up to the date of his death, 3 years later, suddenly from cerebral hæmorrhage."
328	1901 May	Dr. Williams	F.	73	9 months	Pelvis blocked	Refused	—	—	



Number.	Date.	Medical Attendant.	Sex.	Age.	Duration of Symptoms.	Height of Disease from Anus.	Treatment.	Result.		Remarks.
								Immediate.	Secondary.	
329	1901 May	Dr. Lambert	M.	55	14 months	3½ inches	Excision	Recovery	Recurred	High up; sacrum divided. Died 4 years later with recurrence, which showed itself 2 years after the excision.
330	1901 May	Dr. Champneys	F.	50	8 months	4 inches	Excision Colotomy	Recurred Death	—	A ring of disease 1½ inches wide surrounding the bowel, at a distance of four inches from anus. sacrum divided; recurred in 8 months. Colotomy; died well till the tenth day, when she had a sudden and violent bleeding from the colotomy wound from which she never rallied.
331	1901 May	Harrison Cripps	F.	48	18 months	Palvis blocked	Colotomy	Recovery	—	Lived 18 months.
332	1901 Aug.	Dr. Court	F.	50	1 year	4 inches	Colotomy	Recovery	—	Lived in comfort and without pain 15 months. I had operated on this patient's mother 8 years previously, performing colotomy for complete obstruction.

333	1901 Nov.	Mr. Walter Jessop	F.	53	5 months	$\frac{1}{2}$ inch	Excision	Recovery	Well 4 years	The disease commenced at anal margin, ulcerated with indurated raised border. It involved two-thirds of the circumference of the bowel and extended upwards a couple of inches from the anus. January 1906.—Perfectly well, no sign of recurrence; control perfect.
334	1901 Dec.	Dr. Forbes	F.	60	14 months	4 inches	Excision	Death	—	Patient a drinker. Peritoneum opened at operation; did well till 10th day. Acute cellulitis then set in, spread rapidly. Death 3 days later.
335	1902 Jan.	Dr. Horsford	F.	40	18 months	High up	Colotomy	Recovery	—	
336	1902 Jan.	Mr. Sinclair (Belfast)	F.	35	8 months	5 inches	Excision	Recovery	Well 4 years	A ring of adenoid cancer at 6 inches, producing tight stricture. Bowel could be invaginated and growth pulled down to within an inch of the anus. Excised and cut ends joined. Mr. Sinclair writes, January 1906: "General health good; no stricture; no secondary deposits. There was a curious soft nodule at anal edge which I removed some time ago."

Number.	Date.	Medical Attendant.	Sex.	Age.	Duration of Symptoms.	Height of Disease from Anus.	Treatment.	Result.		Remarks.
								Immediate.	Secondary.	
337	1902 Jan.	Dr. Penruddock	M.	70	14 months	3½ inches	Excision Colotomy	Recovery	—	Recurrence 11 months after excision; colotomy.
338	1902 Feb.	Mr. Paterson	M.	44	Not stated	1½ inches	Excision	Recovery	—	
339	1902 Feb.	Dr. Favill	M.	50	18 months	Pelvis blocked	Colotomy	Recovery	—	Lived 2 years.
340	1902 Feb.	Harrison Cripps	M.	54	10 months	4 inches	Colotomy	Recovery	—	Lived over 2 years.
341	1902 April	Not stated	M.	60	18 months	High up	Colotomy	Recovery	—	
342	1902 April	Dr. Leonard	F.	40	12 months	5 inches	Colotomy	Recovery	—	
343	1902 June	Not stated	M.	40	15 months	4½ inches	Palliative	—	—	
344	1902 June	Dr. Morgan	M.	44	Not stated	High up	Palliative	—	—	Death 8 months.
345	1902 July	Dr. Adams (Martock)	F.	60	10 months	4½ inches	Refused	—	—	Death 7 months.

# CASES OF RECTAL CANCER

243

346	1902 July	Dr. Weakley	F.	50	12 months	2½ inches	Excision	Recovery	Well 4 years	No recurrence, 4 years; very adherent to vaginal wall, but dissected off without opening vagina.
347	1902 Aug.	Dr. Weakley	F.	64	8 months	2½ inches	Excision	Recovery	Well 4 years	No recurrence 3½ years. Tip of sacrum removed with coccyx. Peritoneum extensively opened.
348	1902 Aug.	Harrison Cripps	M.	58	5 months	3 inches	Excision	Recovery	Recurred	Recurred in 1 year; second operation; recurred again 2 years later.
349		Mr. Sinclair	M.	24	6 months	4 inches	Excision	Recovery	Well 3½ years	A ring of growth at 3½ inches up. Mr. Sinclair writes, March 1906: "Patient in good health; no sign of recurrence."
350	1902 Nov.	Dr. Weakley	F.	44	8 months	1 inch	Excision	Recovery	Well 3½ years	Commencing just within anus and extending upwards about 3 inches; two-thirds of the circumference of the bowel only removed. February 1906. —No sign of recurrence; has excellent control.
351	1902 Dec.	Mr. Jessop	M.	58	18 months	5 inches	Refused	—	—	
352	1902 Dec.	Dr. Moore (Blackheath)	M.	40	Not stated	3 inches	Excision	Recovery	Well 3 years	Small nodule of adenoid cancer 1 inch in diameter. Dr. Moore writes, March 1906: "Patient

Number.	Date.	Medical Attendant.	Sex.	Age.	Duration of Symptoms.	Height of Disease from Anus.	Treatment.	Result.		Remarks.
								Immediate.	Secondary.	
353	1903 Mar.	Dr. Secombe	M.	57	3 months	1 inch	Refused	—	—	quite well ; no return of the growth."
354	1903 April	Dr. Miller	M.	70	8 months	4 inches	Palliative	—	—	Deeply ulcerated growth 1½ inch diameter, just within the anus.
355	1903 April	Mr. Gay	M.	58	10 months	3 inches	Refused	—	—	
356	1903 May	Not stated	M.	42	6 months	4 inches	Refused	—	—	
357	1903 July	Dr. Bell	F.	48	18 months	5 inches	Colotomy	Recovery	—	Lived 13 months. Dr. Bell writes: "Was greatly relieved and benefited by the operation."
358	1903 July	Harrison Cripps	M.	54	7 months	4 inches	Refused	—	—	
359	1903 July	Dr. Richards	M.	47	Not stated	4½ inches	Refused	—	—	
360	1903 Aug.	Dr. Crombie	F.	65	1 year	Pelvis blocked	Colotomy	Recovery	—	The abdomen greatly distended with ascitic fluid — many

quarts. Upper line of stitches gave way on seventh day, some small intestine protruding. A few hours later the bowel was carefully restitched, and the patient had no further trouble. Dr. Crombie writes: "The patient eventually fell into the hands of a cancer-curer, who gave some powders, the action of which was so powerful that they produced violent purging, collapse and death."

Complete obstruction for 10 days. Operation refused on the ground of expense!

Disease rather firmly fixed. Sacrum divided and peritoneum extensively opened.

361	1903 Aug.	—	F.	60	18 months	Pelvis blocked	Palliative	—	—	
362	1904 July	Dr. Lewis Jones	F.	48	16 months	4 inches	Refused	—	—	
363	1904 Aug.	—	M.	35	15 months	4 inches	Palliative	—	—	
364	1904 Aug.	Dr. A. Smith	F.	60	2 years	Pelvis blocked	Refused	—	—	
365	1904	Dr. Everley Taylor	F.	55	8 months	4 inches	Excision	Recovery	Well 2 years	

Number.	Date.	Medical Attendant.	Sex.	Age.	Duration of Symptoms.	Height of Disease from Anus.	Treatment.	Result.		Remarks.
								Immediate.	Secondary.	
366	1904 Aug.	Dr. Palgrave	M.	53	14 months	3½ inches	Colotomy	Recovery	—	Lived 13 months.
367	1904 Dec.	Harrison Cripps	M.	38	8 months	3 inches	Colotomy	Recovery	—	
368	1905 Jan.	—	M.	62	1 year	5 inches	Colotomy	Recovery	—	Patient died 1 year later.
369	1905 Jan.	Dr. Knott	M.	68	13 months	2 inches	Refused	—	—	A small mass of adenoid cancer on anterior wall close to the anus.
370	1905 Feb.	Harrison Cripps	M.	47	15 months	4 inches	Palliative	—	—	Death 5 months.
371	1905 Mar.	Dr. Crosse	M.	61	2 years	Pelvis blocked	Colotomy	Recovery	—	Still alive.
372	1905 Mar.	Dr. Ball	M.	58	7 months	4 inches	Refused	—	—	
373	1905	Dr. Gregory	M.	48	Not stated	3 inches	Refused	—	—	Advised excision.
374	1905 May	Sir T. Smith	M.	52	13 months	5 inches	Excision	Recovery	Recurred	Recurred in 8 months; second operation, 1906.

375	1905 May	Harrison Cripps	M	62	15 months	4½ inches	Palliative	—	—	Posterior two-thirds of the bowel removed to a height of four inches. Did well till 8th day, when she died almost suddenly.
376	1905 June	Sir W. Whitla	F.	75	8 months	3½ inches	Excision	Death	—	Lived 4 months
377	1905 July	Dr. Beadles	M.	70	18 months	Pelvis blocked	Palliative	—	—	
378	1905 July	Dr. Atkins	M.	46	Not stated	5 inches	Palliative	—	—	
379	1905 Nov.	W. L. Cripps	M.	70	8 months	3½ inches	Excision	Recovery	—	A patch of growth 1½ inch diameter on left side of bowel 3½ inches from anus, very freely removed. No recurrence 6 months.
380	1905 Nov.	Dr. Holderness	F.	30	9 months	3 inches	Refused	—	—	A ring of adenoid cancer 1½ inches wide surrounding the bowel at three inches, freely movable.



TABLE B

SHOWING NUMBER OF CASES AT EACH PERIOD OF LIFE.

Under 20 years . . . . .	3
Between 20 and 30 years . . . . .	3
"    30 " 40 " . . . . .	21
"    40 " 50 " . . . . .	78
"    50 " 60 " . . . . .	93
"    60 " 70 " . . . . .	119
"    70 " 80 " . . . . .	53
Over 80 years . . . . .	4
Not stated . . . . .	6
<hr/>	
Total . . . . .	380

TABLE C

SHOWING SEX OF PATIENTS.

Males . . . . .	249
Females . . . . .	131
<hr/>	
Total . . . . .	380

TABLE D

SHOWING METHODS OF TREATMENT ADOPTED.

Operation advised in . . . . .	283 cases.
Palliative treatment advised in . . . . .	97 " . . . . .
<hr/>	
Total . . . . .	380 " . . . . .
Refused advice . . . . .	55 cases.
Colotomy performed . . . . .	143 " . . . . .
Excision " . . . . .	85 " . . . . .
<hr/>	
Total cases operated on, 228.	

TABLE E

**SHOWING THE MORTALITY FROM EXCISION OF THE RECTUM AND SUBSEQUENT  
HISTORY OF THOSE WHO RECOVERED.**

Died	.	.	.	4
Recovered	.	.	.	81
				—
Total	.	.	.	85

### SUBSEQUENT HISTORY OF THE 81 CASES OF RECOVERY.

Died from various causes without local recurrence . . . . .	6
Disease recurred . . . . .	33
Remained well (cured) after 3 years . . . . .	32
Remained well under 3 years . . . . .	4
Subsequent history not ascertained . . . . .	6
Total . . . . .	81

(See page 387).

TABLE F

SHOWING THE LENGTH OF TIME AFTER EXCISION AT WHICH PATIENTS WERE  
ALIVE WITHOUT RECURRENCE .

Under 3 years, number alive	.	.	.	.	.	4
Over 3 "	.	.	.	.	.	5
" 4 "	.	.	.	.	.	6
" 5 "	.	.	.	.	.	5
" 6 "	.	.	.	.	.	2
" 7 "	.	.	.	.	.	1
" 8 "	.	.	.	.	.	1
" 9 "	.	.	.	.	.	2
" 10 "	.	.	.	.	.	2
" 11 "	.	.	.	.	.	1
" 12 "	.	.	.	.	.	1
" 14 "	.	.	.	.	.	2
" 16 "	.	.	.	.	.	1
" 19 "	.	.	.	.	.	1
" 20 "	.	.	.	.	.	1
" 22 "	.	.	.	.	.	1
Total	.	.	.	.	.	36

Some details of these successful cases will be found in Table A under the following numbers: 2, 23, 35, 41, 50, 70, 102, 116, 144, 184, 187a, 189, 191, 198, 213, 230, 250, 258, 261, 263, 284, 285, 294, 296, 307, 308, 315, 320, 322, 328, 331, 341, 342, 345, 360, 374.

**C.R.**

**R**

TABLE G

SHOWING IN 31 CASES THE DATES AT WHICH RECURRENCE WAS NOTICED.

Under 6 months, number of cases	8
Between 6 and 9 months, number of cases	10
"    9    "    12    "    "	6
"    12    "    18    "    "	3
"    18    "    24    "    "	3
After 24 months	1
<b>Total</b>	<b>31</b>

TABLE H

SHOWING THE LENGTH OF LIFE AFTER THE PATIENT WAS FIRST SEEN WHEN  
NO OPERATION WAS PERFORMED IN 71 CASES IN WHICH THE  
DATE OF DEATH WAS ASCERTAINED.

Lived less than 3 months, number of cases	.	.	.	.	8
„ between 3 and 6 months, number of cases	.	.	.	.	25
„ „ 6 „ 9 „ „	.	.	.	.	23
„ „ 9 „ 12 „ „	.	.	.	.	8
„ „ 12 „ 18 „ „	.	.	.	.	3
„ „ 18 „ 36 „ „	.	.	.	.	4
Total	.	.	.	.	71

**Average length of life, 7.8 months.**

### TABLE I

COMPARISON WITH TABLE H, SHOWING DURATION OF LIFE AFTER COLOTOMY  
IN ASCERTAINED 97 CASES.

Lived less than 6 months, number of cases	10
„ between 6 and 12 months, number of cases	11
„ 12 „ 18 „ „	19
„ 18 „ 24 „ „	18
„ 24 „ 30 „ „	20
„ 30 „ 36 „ „	5
„ over 3 years, number of cases	10
„ 4 „ „	3
„ 8 „ „	1*
Total	97

Average of life after colotomy, 22 months.

\* Case 264 page 492.

TABLE J

SHOWING THE RELATIVE RATE OF MORTALITY FROM COLOTOMY WHEN  
PERFORMED AFTER AND BEFORE COMPLETE OBSTRUCTION  
IN 143 CASES.

After complete obstruction, number of cases . . . .	20	
Before                   "                   "                   . . . .	123	
	Recovered.	Died.
After complete obstruction . . . .	9	11
Before                   "                   . . . .	118	5
Total . . . . .	127	16
Mortality after complete obstruction . . . .	55 per cent.	
" before                   "                   . . . .	4.6	"

TABLE K

SHOWING THE NUMBER OF DAYS OF TOTAL OBSTRUCTION BEFORE COLOTOMY  
WAS PERFORMED IN THE 11 FATAL CASES.

Reference No. in Table.	Number of Days.
75 . .	12
131 . .	11
142 . .	13
147 . .	7
197 . .	13
208 . .	14
227 . .	12
234 . .	Not stated.
251 . .	9
264 . .	10
312 . .	10



# INDEX

	PAGE
ABDOMINAL section for diagnosis	94
Abscess, diagnosis from cancer	86
Adenoid growths, diagnosis by microscope	51
downward extension of	48
Air, passage of, per urethram	240
Allingham, Herbert	128
Amussat	127
Anastomosis, end to end	167
Anus, contraction of, after excision	111
Aseptic surgery	106
BAKER, Morant	5
Balgarnie, notes by	164
Ball, case of sarcoma	27
Ballance, Mr., on cancer	24
Bandage, T	120
Basement membrane, absence of	43
Bennet, Sir W.	94
Billroth	102
Bladder accidentally opened	116
Bougies	73
after proctotomy	88
arrested by rectal folds	73
danger in passing	73
death caused by	70
prevention of contraction by	124
Bowel below stricture	91
Breschet, case by	73
Briddon	111
Bright, Dr., case by	85
<i>British Medical Journal</i>	129
Brooks, Mr., case by	87, 88
Bryant	226
Butlin	90
CACHEXIA, cancerous	91
in fibrous stricture	90
Callender	90
Cancer, annular stricture, formation of	31
auto-inoculation of	14, 39
bacilli in	24
case of long duration of	82
case of, scraping in	161
causing intussusception	72
commencement of growth	38
compared with acute necrosis	23
inflammation	20
oak galls	22
pyæmia	15
specific infections	21

Cancer—continued	PAGE
death rate	1
epithelium, formation of, in	48
extension into fat	33
fibrous tissue, formation in	42
following injury	10
fungating masses of	34
glandular structure of	29
growth on free surface	40
increase of	2
inheritance of	4
inoculation of	24
laminar form	31
local irritation, cause of	18
origin of	12
melanotic case of	27
method of extension	50
multiple nodules in	36
pathology of	26
of rectum	1
abdominal section	125, 127
adenoid tissue in	38
annular stricture in	68
sudden blocking	71
colloid	74
curetting	146, 151
danger in examination	69
diagnosis, differential	77
from acute inflammation	85
from disseminated polypi	78
from inflammatory disorders	85
from villous tumour	77
when high up	70
diarrhoea	155
diet	143
differential diagnosis from	87
fibrous stricture	66
digital examination in	72
dilatation above stricture	90
discharge in	154
drugs	89
duration of	156
enemas in	1
etiology of	158
illustrative cases of	103
implicating vagina	1
Jacksonian prize essay on	31
laminar form	155
local treatment	

	PAGE		PAGE
Cancer of rectum— <i>continued</i>		Disseminated polypi, case of	79
melanotic	76	post-mortem on	80
mistaken for enlarged		Doig, case by	86
prostate	83	Doran, Alban	158
pain	164	Douglas's pouch	94, 103
palliative treatment	153		
post-mortem	84	ECBASEUR	100
sacral excision	166	Edwards, Mr. Swinford, case by	62
stricture, deaths after ex-		on excision of rectum	101
amination	69	Eve	101
symptoms	60	Examination under anæsthetic	105
bleeding	61	under ether	98
diarrhoea	63	Excision of cancer of rectum	100
discharge	63	after-condition	109
pain	60	after-treatment	122
tenesmus	166	amount of benefit	107
typical case	55	bladder sound	115
Chassignac	100	dressing	119
Clarke, Bruce, case by	86	fatal cases	112, 106
Clover's clutch	100	incontinence after	109
Colotomy	128	instruments	112
acute obstruction after	150	occurrence	108
advantages of inguinal	138	operation from perineum	112
bowel distended	148	percentage of cases	108
falling back	149	peritoneum	105
complications after	148	prevention of stricture	124
condition of patient after	134	risk to life	105
danger in opening bowel	152	selection of cases	112
of delay	137	separation anteriorly	114
difficulty in finding bowel	146	stricture after	111
dressings	143	transfixion	118
duration of life after	131	trans-sacral	120
excess of bowel	145	use of bougie	164
guide sutures	141	Exploratory laparotomy	98
hæmorrhage after	151		
in complete obstruction	133	FÆCES, passage of, per urethram	231
in fat patients	147	Faget	100
in rectal cancer	165	Fibro-muscular tumour mistaken	
inguinal	128	for cancer	96
lumbar	128	Fistula, entero-vesical	225
mortality	129	diagnosis	233
objections to inguinal	139	due to abscess	228
to lumbar	137	from cancer	227
opening of bowel	143	inflammation	228
preventing obstruction	129	stricture	229
primary union	144	ulceration	229
relief of symptoms	129	palliative treatment	242
removal of scybala	135	pathology of	226
retarding growth	130	prognosis	232
risks to life	132	retention of urine in	232
syringing	135	situation of	236
time for operating	136	sufferings in	231
truss	145	symptoms in	229
Concretions	95	traumatic	226
Conor, Dr., case by	62	treatment by abdominal	
Cooper, Sir Alfred	101	section	241
Crucilhier, case by	75	by colotomy	240
Cure of cancer, three years' limit	108	by supra-pubic cysto-	
Cyst of rectum	97	tomy	241
		resembling cancer	97
DIAGNOSIS, errors in	89	Kothergill	296
Dieffenbach	100	Frampton	98
Discharge in malignant stricture	90	Fumouze	100

# INDEX

255

	PAGE		PAGE
GODSON, Dr. Clement . . . . .	88	Prostate . . . . .	103, 99, 116
Goodhart, Dr., on cancer . . . . .	13	Protrusion of omentum . . . . .	148
Gowland, Mr., case by . . . . .	9		
		RECTANGULAR needle . . . . .	118
HÆMORRHOIDS in rectal cancer . . . . .	162	Rectum, examination by hand, danger of . . . . .	74
		Reeves . . . . .	129
INGUINAL glands . . . . .	91	Renal tumour . . . . .	98
Invagination of rectum . . . . .	95, 98	Ricamier . . . . .	100
Irritable bowel . . . . .	98	Rigidity of malignant stricture . . . . .	91
		Roberts . . . . .	101
JACKSONIAN prize essay . . . . .	111	Rodent ulcer . . . . .	92
KELSEY . . . . .	111	SACRAL excision after anastomosis . . . . .	167
		plexus . . . . .	121
LABIAL abscess . . . . .	94	Sankey . . . . .	94
Lisfranc . . . . .	110	Schuh . . . . .	100
Littre . . . . .	118	Sepsis, deaths from . . . . .	106
Lockwood . . . . .	138	Shattock, Mr., on cancer . . . . .	24
Lupus . . . . .	92	Smith, Dr. F. O. . . . .	91
		Smith, Mr. Montague . . . . .	82
MAISONNEUSE . . . . .	100	Smith, Sir Thomas, case by . . . . .	79
Marchand . . . . .	100	Spasmodic pains . . . . .	98
Marshall, Dr. . . . .	96	Stercolith . . . . .	98
Massé . . . . .	100	Sturge, Dr. Allen, of Nice . . . . .	84
Mesentery, absence of . . . . .	146	Suicide in entero-vesical fistula . . . . .	141
Microscopic examination . . . . .	244, 245		
Morgagni . . . . .	100	TABLE A, explanation of . . . . .	168
Morrison, Dr., case by . . . . .	61	Tables . . . . .	169-234
Moore, Dr. Norman . . . . .	63	Teale, Mr. Pridgin, case by . . . . .	54
		Thomson, Sir Henry . . . . .	151
NEEDLE, rectangular . . . . .	113	Time important in diagnosis . . . . .	88
New growth outside rectum . . . . .	81	Trans - sacral excision, primary union . . . . .	121
Nussbaum . . . . .	117	Trendelenburg . . . . .	125
		Tubercular ulceration . . . . .	91, 92
OVARY, ossifying, resembling cancer . . . . .	94	Tuttle . . . . .	101
PAGET, Sir James . . . . .	107	ULCER resembling cancer . . . . .	94
on cancer . . . . .	4	Urine, passage of air with . . . . .	235
Payne, Dr., on cancer . . . . .	3	passage of fæces with . . . . .	235
Pepper . . . . .	92	Uterus . . . . .	98
Peritoneum . . . . .	104		
Pinault . . . . .	100	VELPEAU . . . . .	100
Power, D'Arcy, on cancer . . . . .	24	Villous papilloma . . . . .	97









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